

3626
#8



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost

Art Unit : 3626

Serial No. : 08/868,762

Examiner : V. Sakran

Filed : June 4, 1997

Title : HOOK FOR HOOK AND LOOP FASTENERS

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United States Patent and Trademark Office

Washington, D.C. 20231

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RESPONSE TO NOTICE UNDER 37 CFR 1.251

In response to the action mailed May 31, 2001, enclosed is a complete copy of Applicant's record of all correspondence from and to the Office, along with a completed Form PTO-2053-B. Applicant is not aware of any correspondence with the Office with respect to the above application that is not among Applicant's records.

Respectfully submitted,

Date: June 13, 2001

James W. Babineau

Reg. No. 42,276

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804
Telephone: (617) 542-5070
Facsimile: (617) 542-8906
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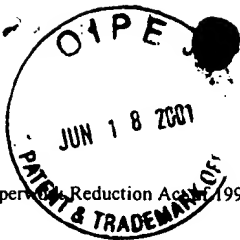
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I hereby certify under 37 CFR §1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated below and is addressed to the Commissioner for Patents, Washington, D.C. 20231.

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Date of Deposit

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Signature

Toni M. Sousa
Typed or Printed Name of Person Signing Certificate



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In re Application of:

George A. Provost

Application No.:

08/868,762

Filing Date:

June 4, 1997

Title:

HOOK FOR HOOK AND LOOP FASTENERS

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NOTICE UNDER 37 CFR 1.251 - Pending Application

JUN 25 2001

Statement (check the appropriate box):

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☒ The copy submitted with this reply is a complete and accurate copy of applicant's record of all of the correspondence between the Office and the applicant for the above-identified application (except for U.S. patent documents), and applicant is not aware of any correspondence between the Office and applicant for the above-identified application that is not among applicant's records.

☐ The copy of the paper(s) listed in the notice under 37 CFR 1.251 is/are a complete and accurate copy of applicant's record of such paper(s).

☐ The papers produced by applicant are applicant's complete record of all of the correspondence between the Office and the applicant for the above-identified application (except for U.S. patent documents), and applicant is not aware of any correspondence between the Office and the applicant for the above-identified application that is not among applicant's records.

☐ Applicant does not possess any record of the correspondence between the Office and the applicant for the above-identified application.

June 11, 2001
Date

James Babineau Reg No 42,276
Signature
James Babineau
Typed or printed name

A copy of this notice should be returned with the reply.

Burden Hour Statement: This collection of information is required by 37 CFR 1.251. The information is used by the public to reply to a request for copies of correspondence between the applicant and the USPTO in order to reconstruct an application file. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This form is estimated to take 60 minutes to complete. This time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.



Attorney's Docket No.: 05918-005003 / 2880

7

Applicant : George A. Provost

Serial No. : 08/868,762

Filed : June 4, 1997

Title : HOOK FOR HOOK AND LOOP FASTENERS

Art Unit : 3507

Examiner : V. Sakran

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TABLE OF CONTENTS

TO 3600 MAIL ROOM

TAB	DESCRIPTION	FILED/MAILED
1	Reissue Application; Order for Title Report; Assent by Assignee; Offer to Surrender; Declaration and Petition of George A. Provost w/ Exhibit A	06/04/97
2	Communication; Proposed Information Disclosure Statement	06/13/97
3	Information Disclosure Statement	10/30/97
4	Office Action; Initialed PTO-1449	01/09/98
5	Response to O/A; Petition for One Month Extension of Time	04/29/98
6	Status Inquiry	10/04/00

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REISSUE APPLICATION CHECKLIST

Client/Matter Number: 05918/005003
 Client/Matter Name : Velcro Ind./740 Reissue

June 4, 1997

LEGAL STAFF

Yes No

☒ ☐ There is an earlier application that might possibly disclose the inventions claimed in the present application. (If you check "Yes", there is likely an effect on foreign filing options.) *N/A*

Yes No

☒ ☐ There was or soon will be a possible disclosure of the inventions claimed in the present application. (If you check "Yes", there is likely an effect on foreign filing options.)

Checked By: *[Signature]*

Handling Atty

NOTE: THE HANDLING ATTORNEY MUST WITHOUT EXCEPTION REVIEW THE FILE AND PERSONALLY INITIAL FOR THE ABOVE ITEMS!

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FOR ALL ORIGINAL PATENT APPLICATIONS ONLY

Under the F&R Patent Application Case Review Program, this application was assigned to *[initials]* for review. Was this application reviewed? Yes ☐ No ☐

1st 2nd
 Check Check

☒ ☒ If CIP, parent case is COMPLETE and PENDING. A Response to Missing Parts, and/or Petition for Extension has been/is being filed.

☒ ☐ Express Mail Declaration includes correct Mailing Label Number and Express Mail Mailing Label stub or sticker is attached to the Declaration.

☒ ☒ Postcard includes Express Mail Mailing Label Number, billing attorney's initials and lists all papers being sent and the pages of each.

☒ ☒ Check for filing fee attached or deposit account charged on transmittal letter. *Check amount*

☒ ☒ Transmittal letter is complete and accurate, names ALL inventors and includes Express Mail stamp. *on duplicate*

☒ ☒ Cover sheet includes title, names of ALL inventors, and Express Mail stamp.

☒ ☐ Specification includes client/matter numbers, all pages are present and checked for printer errors, and all pasted in tables and handwritten symbols are included. Number of pages: 6

☒ ☒ At least one claim is included. Number of pages: 9; number of claims: 37

☒ ☒ An abstract is included and shows document number. Number of pages: 1

[initials] ☒ Appendices, if any, include all pages and cover sheets of each include an Express Mail stamp. Titles and pages of each: _____

[initials] ☒ Microfiche appendix, if any, referenced at start of specification. Title and number of fiche: _____

[initials] ☒ Declaration and Power of Attorney is signed/unsigned (circle one).

☒ ☒ All figures are included and checked against the list of figures in the specification. All lines and numerals are legible. All copies are complete. Figure stamp appears on back of all sheets. Number of sheets: 3

[initials] ☒ Assignment, if filed, is complete and includes Recordation Cover Sheet. Check for assignment fee is attached. Check amount: _____

[initials] ☒ Small Entity Declaration, if paying small fee, is signed by proper company officer or inventor.

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IDS, if included, lists all art cited by the applicant or examiner in any related application and any new art. Copies of all the art are included.

Express Mail Mailing Label is addressed to "Assistant Commissioner for Patents, Washington, DC 20231, Box-PATENT APPLICATION", includes client/matter number, and is affixed to an Express Mail envelope.

Transmittal letter is signed by attorney/agent. Express Mail stamps all include correct mailing label number and are signed and dated.

File copies are complete, including all signatures and dates.

ADDIF is prepared. IDS and convention dates entered in manual docket.

Drafting Request (with copies of informal drawings) is prepared. If not, explain why:

Printed and disk copy of DNA sequence listings, if any, are in PTO format/to be typed/to be provided by client (circle one). If not in PTO format, name of F&R person responsible for getting listings done:

Photographs, if any, are included/requested from client (circle one). If requested from the client, expected date of return:

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Atty/Agent

Office Services

CAC 6/4/97
2nd Checker & Date

INSTRUCTIONS

This checklist is intended to minimize errors in the filing of U.S. patent applications. It must be completed for all original and continuation-in-part patent applications. Highlighted items are mandatory for every application at filing. Non-highlighted items may be completed after filing in emergency situations.

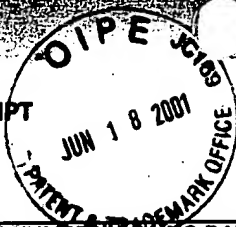
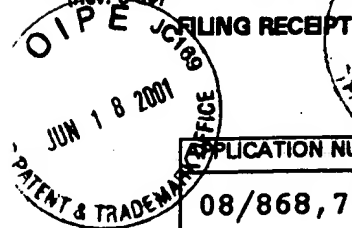
- Step 1** First Checker (typically, the attorney/agent's secretary) reviews each item on the checklist, completes any information requested, and checks each box in the first column of boxes. Note: The first check is done BEFORE the attorney/agent signs anything. When the first check is complete, the first checker initials the checklist where indicated and presents the application and checklist to the attorney/agent.
- Step 2** Attorney/Agent reviews the application and the first set boxes on the checklist, initials the checklist where indicated, signs the transmittal letter and returns the application to the first checker who calls office services to have the Express Mail stamps signed.
- Step 3** Office Services Person reviews the first column of boxes on the checklist for completeness, initials the checklist where indicated and signs all Express Mail stamps. Then the second checker makes all file copies and calls the second checker to double check the application.
- Step 4** Second Checker reviews each item on the checklist, checks each box in the second column of boxes, initials the checklist where indicated, seals the application in the Express Mail envelope, and gives it to the office services person to deliver to the Post Office.
- Step 5** Office Services Person returns a completed Express Mail Receipt to the second checker and signs the Declaration of Express Mail.

If at any point in the above steps the application does not comply with at least the highlighted requirements of the checklist, the application and checklist are to be returned to the first checker with an explanation of what is wrong so that it can be corrected.

If the application is when a second checker is unavailable, the first checker should complete the first column of boxes, ensure that all necessary signatures and copies are made, and then file the application, leaving the checklist and file with the second checker to be completed the next business day.

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Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	GRP ART UNIT	FIL FEE REC'D	ATTORNEY DOCKET NO.	DRWGS	TOT CL	IND CL
08/868,762	06/04/97	3507	\$1,112.00	5312/005002	3	21	5

~~JOHN N. HILLMAN~~
FISH & RICHARDSON
225 FRANKLIN STREET
BOSTON MA 02110-2804

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OCT 03 1997

FISH & RICHARDSON P.C.
BOSTON, MA

Receipt is acknowledged of this nonprovisional Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. If an error is noted on this Filing Receipt, please write to the Application Processing Division's Customer Correction Branch within 10 days of receipt. Please provide a copy of the Filing Receipt with the changes noted thereon.

Applicant(s)

GEORGE A. PROVOST, LITCHFIELD, NH.

CONTINUING DATA AS CLAIMED BY APPLICANT-

THIS APPLN IS A RE OF 07/932,633 08/20/92 PAT 5,315,740

FOREIGN FILING LICENSE GRANTED 09/24/97

TITLE

HOOK FOR HOOK AND LOOP FASTENERS

PRELIMINARY CLASS: 024

* No Docketing Required *

Reviewed By Practice Systems

Initials: *pmb*

Reviewed By Billing Secretary

Initials: _____

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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PATENT

ATTORNEY DOCKET NO.: 05918/05003

The Patent and Trademark Office date stamp sets forth the receipt date (or both the receipt date and the Serial Number) of a patent application identified as follows:

Applicant: George A. Probst

Title: Hook For Hook And Loop Fastener

☒ Transmittal Letter *Reissue Application (duplicate)*
☒ Appln. 6 Pages of Spec. 9 Pages of Claims 37 Total Claims 1 Pages of Abstract
☐ Rule 62 Filing Request (FWC) Pages
☐ Assignment
☐ Deposit Account Order Form (2 copies)
☐ Check \$
☒ Small Entity Statement
☒ Drawings 3 Sheets Formal Sheets Informal
☐ Combined Declaration and Power of Attorney signed unsigned PTO
☐ Preliminary Amendment - Pages
☐ Information Disclosure Statement
☐ PTO 1449 Form - Pages
☐ Prior Art References - Number of References
☐ Priority Document - Pages
☐ English Translation
☒ Other Check for Title Report; Assent by Assignee;
add to combined Declaration + petition of GA Probst + 05918/05003 A.

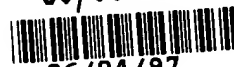
59884 U.S. PTO



06/04/97

69599 U.S. PTO

08/868762



06/04/97

Atty/Sec.

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Matter Name Hook For Hook And Loop Fastener

Date 6/4/97

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- ☐ Total number of claims in the application, noted on the filing receipt, noted in the transmittal letter match.
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05918/005003

Jonathan J. Wainer

FISH & RICHARDSON PC

125 FRANKLIN ST FL 32

BOSTON

MA 02110-2804

TO: (PLEASE PRINT)

PHONE

BOX REISSUE APPLICATION

Assistant Commissioner of Patents

Washington, D.C. 20231





PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Patent No. : 5,315,740
Issued : May 31, 1994
Title : HOOK FOR HOOK AND LOOP FASTENER

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Washington, DC 20231

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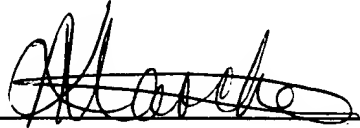
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Date: JUNE 4 1997





F + R

PATENT

ATTORNEY DOCKET NO.: 05918/05003

The Patent and Trademark Office date stamp sets forth the receipt date (or both the receipt date and the Serial Number) of a patent application identified as follows:

Applicant: George A. ProvostTitle: Hook For Hook And Loop Fastener

☒ Transmittal Letter Reissue Application (duplicate)
☒ Appln 6 Pages of Spec. 9 Pages of Claims 37 Total Claims 1 Pages of Abstract
☐ Rule 62 Filing Request (FWC) Pages
☐ Assignment
☐ Deposit Account Order Form (2 copies)
☐ Check \$
☒ Small Entity Statement
☒ Drawings 3 Sheets Formal Sheets Informal
☐ Combined Declaration and Power of Attorney signed unsigned
☐ Preliminary Amendment - Pages
☐ Information Disclosure Statement
☐ PTO 1449 Form - Pages
☐ Prior Art References - Number of References
☐ Priority Document - Pages
☒ English Translation
☒ Other Chosen for PPH Report; Assent by Assignee;
also to evidence Declaration + petition of GA Provost with SA.
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Initials hw/da Matter Name VEK/Incl/740855ug Date 6/4/97



05918-135001

FISH & RICHARDSON P.C.

225 Franklin Street
Boston, Massachusetts
02110-2804

John N. Williams, Esq.
Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804

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Applicant or Patentee George A. Puckett
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June 4, 1997

Attorney Docket No.: 05918/005003

BOX REISSUE APPLICATION

Assistant Commissioner of Patents
Washington, DC 20231

Presented for filing is a Reissue Patent Application of:

BOSTON
HOUSTON
NEW YORK
SOUTHERN CALIFORNIA
SILICON VALLEY
TWIN CITIES
WASHINGTON, DC

U.S. Patent No. : 5,315,740
Issued : May 31, 1994
Applicant : GEORGE A. PROVOST
Title : HOOK FOR HOOK AND LOOP FASTENER

Enclosed are the following papers:

Pages of Specification	6
Pages of Claims	9
Pages of Abstract	1
Sheets of Drawing	3
Order for Title Report (duplicate)	1
Assent By Assignee	2
Offer to Surrender	1
Declaration and Peition of George A. Provost (with attached Exhibit A)	15

Reissue filing fee	770.00
Reissue claims in excess of 20 times \$22.00	374.00
Reissue independent claims in excess of 3 times \$80.00	160.00
Multiple dependent claims	260.00
Total Reissue filing fee:	\$ 1564.00

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Kyra Marche
KYRA MARCHE

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June 4, 1997

Page 2

Please charge the filing fee and any other required fees, or apply any credits, to Deposit Account No. 06-1050, referencing the Attorney Docket number shown above. A duplicate copy of this transmittal letter is attached.

If this application is found to be INCOMPLETE, or if it appears that a telephone conference would helpfully advance prosecution, please telephone the undersigned at 617/542-5070.

Kindly acknowledge receipt of this application by returning the enclosed postcard.

Respectfully submitted,

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Enclosures



REISSUE APPLICATION
FOR
UNITED STATES LETTERS PATENT

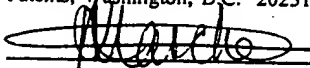
TITLE: HOOK FOR HOOK AND LOOP FASTENERS
APPLICANT: GEORGE A. PROVOST

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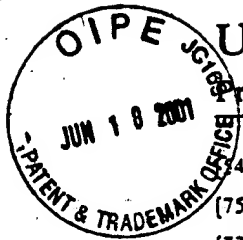
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KYRA MARCHE



United States Patent [19]

Provost



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[11] Patent Number: 5,315,740

[45] Date of Patent: May 31, 1994

[74] HOOK FOR HOOK AND LOOP FASTENERS

[75] Inventor: George A. Provost, Litchfield, N.H.

[73] Assignee: Velcro Industries, B.V., Amsterdam, Netherlands

[21] Appl. No.: 932,633

[22] Filed: Aug. 20, 1992

[51] Int. Cl.³ A44B 18/00

[52] U.S. Cl. 24/452; 24/442; 24/449

[58] Field of Search 24/452, 451, 450, 449, 24/442, 448

[56] References Cited

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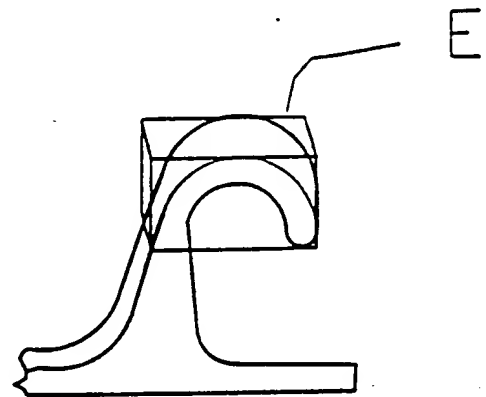
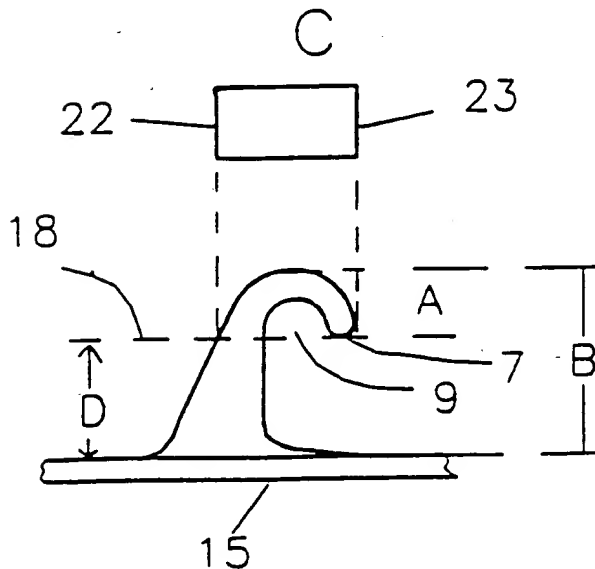
Primary Examiner—Victor N. Sakran

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[57] ABSTRACT

A plastic molded hook for use with a hook and loop fastening system especially adapted for use with low profile loops. The hook design includes a base, a stem and a crook whereby the volume of the portion of the hook penetrating into a pile of loops is defined as the displacement volume. Hooks especially adapted for use with low profile loops have a displacement volume of less than 6×10^{-6} cubic inches.

15 Claims, 3 Drawing Sheets



HOOK FOR HOOK AND LOOP FASTENERS

BACKGROUND OF THE INVENTION

This invention relates to an improved hook for hook and loop fasteners and particularly to plastic molded hooks intended for use with low pile loops. The technology of hook and loop fasteners is well known wherein a fastener comprised of two separable pile fastening tapes having interengaging piles on their surfaces, one pile having loop-elements and the other hook elements, are capable of co-acting to form a separable bond.

Such pile fasteners have found a wide variety of uses where ease of opening and closing is desirable such as in clothing, footwear, home furnishings, medical products, automotive fastening and many other industrial situations where detachable or permanent engagement is required. U.S. Pat. No. 3,009,235, U.S. Pat. No. 3,083,737 and U.S. Pat. No. 3,154,837 disclose various forms of separable pile fastener tapes constructed from fibrous forms of synthetic polymers such as nylon using basic textile weaving techniques. Such methods create a base fabric into which is woven the pile surface capable of engaging to form the closure. In more recent times special hook materials have been made from plastic molding techniques wherein the hooks are integrally formed with a base strip as the tape is being formed.

U.S. Pat. No. 3,031,730 describes a closure wherein a surface of burr like elements are exposed on a surface to be positively coupled with a fabric. The burr like elements are in the form of cast or molded flexible or plastic hook like members.

U.S. Pat. No. 3,760,000 to Menzin discloses a hook "eye" having a sloping surface which functions as a cam surface for extracting the molded hook from its mold cavity. The shank surface has two flat sides of equal dimensions and a somewhat larger third side. The shank portion is larger in cross section nearer the web than at the tip of the hook and the three flat side portions of the shank are continuous in smooth curves into and throughout the hook portion with the shank portion of the three sides laying in the same continuous plane as the corresponding face of the hook portion. U.S. Pat. No. 3,312,583 to Rochlis and U.S. Pat. No. 3,708,833 to Ribich describe other embodiments of hooks having somewhat tapered shapes. U.S. Pat. No. 3,913,183 to Brumlik describes a self gripping device wherein the gripping elements are particularly adapted for self gripping fibers and the like along the entire length of the fibers.

U.S. Pat. No. 4,894,060 to Nestegard describes a hook design for a disposable diaper with an improved hook fastener portion wherein the hook is made by the technique of extruding a profile and subsequently slitting the profile to form discrete hooks. The Nestegard patent claims a hook of sufficiently small dimensions for engaging with low cost loops, particularly loops created by the nonwoven process. The hook shape of the Nestegard patent is considerably different than those of the instant invention because of the method of making the hooks wherein one is dependent upon a continuous profile prior to the cross cutting process. The dimensions disclosed and claimed in the Nestegard patent are not sufficient to calculate a displacement volume.

Even more recently U.S. Pat. No. 4,984,339 to the inventors of the instant application discloses an improved hook having a profile defined by an inner,





the inside of the crook of a hook, as will be more fully appreciated from the description below.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a cross section of a hook of a conventional textile hook and loop closure system.

FIG. 2 depicts the hook of FIG. 1 as it would look engaging into a deep mat of loops in a standard loop strip of a hook and loop closure where the loop height is great relative to the return height of the crook.

FIG. 3 depicts the hook of FIG. 1 engaging a low profile loop where the return of the crook is greater than the height of the loops.

FIG. 4 is a cross section of a plastic molded hook as described in the prior art.

FIG. 5 depicts the hook of FIG. 4 as it would look engaging into a mat of loops in a standard loop element of a hook and loop closure where the hook is engaged with a single loop.

FIG. 6 depicts the hook of FIG. 1 showing the profile of displacement, or footprint, required when the hook penetrates into a mat of loops to a position equal the height of the loops.

FIG. 7 is the cross section of a mushroom hook showing the profile of displacement.

FIG. 8 depicts the hook of FIG. 4 showing the profile of displacement.

FIG. 9 is a cross sectional profile of a hook shape of the present invention and shows the profile of displacement for that hook.

FIG. 10 is the cross section of the hook of the present invention showing the profile of displacement.

FIG. 11 is a three dimensional illustration of the parallelepiped which is defined as the displacement volume.

FIG. 12 is a graph depicting the relationship between shear strength and hook displacement volume for a low profile loop.

BEST MODE FOR CARRYING OUT THE INVENTION

Now referring to FIG. 1, a monofilament(1) strand is bent into a loop shape which is cut along one side of the loop to create the crook(2) of a hook with the residual portion(3) of the monofilament loop separated from the hook end tip(7) of the hook to provide a spaced opening(4) sufficient to permit loop(5) to enter and become entangled within the crook(2). In FIG. 6 the dimension "A" of the hook (1) represents the dimension of the return, or height of the crook, while "B" represents the total height of the hook from its base(6) to the top outside of the crook(2). The rectangle "C" of FIG. 6 represents the footprint of material that penetrates into a loop structure when penetration is just sufficient to position tip (7) below the top of a loop. FIG. 2 illustrates what happens when the hook(1) attempts to penetrate into a mat of loops. The top of the hook, having a footprint as shown in FIG. 6 "C", pushes aside the loops(5) and continues to penetrate into the loop pile until it strikes the base of the loop(8). The loops(5), being resilient, spring back and some of the loops enter the space(4) provided by cutting the monofilament. The crook of the hook ensnares the loop which is well within the interior space(9) formed by the monofilament. In this manner the loop becomes ensnared by the hook and when attempting to separate the hook from the loop, separation is restrained by the two components so engaged. To separate the components, the hook must be deflected or



lines described define the terminal ends of rectangle "C" (22) and (23). "C" represents the area displaced by the hook in penetrating the mat of loops, or put another way the area to which loops must be pushed aside or displaced for penetration to take place. If the loops into which the hooks penetrate are very resilient, they will immediately bend around such a plane and close in behind the face of the plane. However, if the hook is a solid mass, as in fact it is, the loops simply push back against the walls of the hook. The penetrating hooks have in reality a volume and this volume can simply be defined as the volume of a parallelepiped encasing the crook portion of the hook above the point where penetration is sufficient to enable engagement. FIG. 10 shows the position of the parallelepiped "E" relative to the entire hook configuration. FIG. 11 shows the parallelepiped standing alone. The volume of the parallelepiped can be calculated for a single hook by taking the area "C" and multiplying by the height of the crook "A" where $E = A \times C$. We have defined this volume as "displacement volume".

We have found this displacement volume is an important factor in determining the ability of a hook to engage with certain types of loops. When the loop height is very low, hooks of low displacement volume show markedly improved performance even though there is more than simple loop height to contend with when determining the ability of a loop to accept a given hook.

The following table shows displacement volume values for a variety of hook types sold by Velcro USA Inc., the assignee of the instant application.

HOOK TYPE	DISPLACEMENT VOLUME	SHEAR IN LOW LOOP
Standard Textile	6.0×10^{-6}	6.5-10.0
Ultra-Mate 15 style	7.4×10^{-6}	3.0-8.0
Molded 8 style	14×10^{-6}	4.0-9.0
Ultra-Mate 24 style	14×10^{-6}	8.0-13.0
Standard Mushroom	1.6×10^{-5}	15.0-20.0
Molded 22 style	1.1×10^{-5}	22.0-29.0

FIG. 12 is a graph depicting the relationship of shear strength of hooks to displacement volumes for hooks engaged in a low profile loop closure system, loop style #3610 sold by Velcro USA Inc. and having loop height of approximately 0.040 inches. This is a fraction of standard loops such as loop 1000 sold by Velcro USA Inc. which has a loop height of approximately 0.100 inches. Data for the graph is taken from the table above to create the plot shown in FIG. 12. The ordinate of the graph of FIG. 12 shows shear strength measured as the strength per square inch of closure. The abscissa shows displacement volume ranging from 1.1×10^{-6} to 24×10^{-6} cubic inches. It is clear from this graph that displacement volume dramatically influences the ability of a hook to perform in the shear mode for this loop design. The shear starts to increase at 6×10^{-6} and rapidly rises to almost double at 4×10^{-6} . For engaging into short fine loops a hook having a displacement volume of less than 6×10^{-6} is desirable but preferably the displacement volume will be less than 4×10^{-6} .

These indicators can be very useful in designing new hook shapes for specific loop geometries. However, hook displacement volume is by no means the only measure to be used in evaluating the ease of engagement of a hook in a low profile loop even though it is one of the important factors. As explained earlier the height of the crook itself influences the displacement volume of

any particular hook, but in addition, the thickness of the hook has a great effect on the displacement volume. In addition, the general shape of the hook can have a major effect on the displacement volume. The hook shape of U.S. Pat. No. 4,984,339 is especially well suited for engagement with low profile loops and the molding process for making that hook is easily adjusted to achieve the modification of the displacement volume and to produce hooks in the preferred range of displacement as disclosed herein. For example, in FIG. 9 the location of the point(10) where the back side of the hook intercepts the lower plane defining the displacement volume sets the dimension of the footprint "C". If the hook has a very shallow rearward slope the point of intersection(10) will be moved rearward also and the displacement volume will be increased. At the crook tip the placement of the hook tip sets the relative position of this same lower plane and the shorter the crook height the lower the displacement volume. It will be appreciated the displacement volume may be adjusted by altering many of the dimensions of the hook shape. Such adjustment is easily accomplished by the methods disclosed in U.S. Pat. No. 4,794,023.

Heretofore this influence of displacement volume on hook and loop performance has not been understood. Hook design has been a matter of trial and error with little rhyme or reason. Hook selection has been primarily a matter of using the materials available and little effort has gone into designing hooks with the specific geometry to accomplish a specific type of performance. It has been known that using a thicker monofilament would result in greater tape separation forces than would be the case if finer monofilaments were used. The development of mushroom tapes and the size of the head is merely a matter of accident. The head was not designed with any specific shape or size intended.

Understanding of the principles of the engagement problem in fine low profile loops has provided the clue to the development of advanced hook products. I have found that plastic molded hooks with a displacement volume of less than about 6×10^{-6} , and preferably less than 4×10^{-6} , engage especially well in loops with a pile height of less than 0.025 inches. Such fine molded hooks have never before been produced. Development of such hooks is a considerable advance in the art, and for the first time, this understanding permits development of hook tapes which are specifically designed for the very desirable aesthetic and cost effective low profile loops.

I claim:

[1.-A hook for a hook and loop fastening system comprising:

a base;

a stem connected at its lower end to the base, the stem having an outer side and an inner side;

a crook having a first end and a hook tip, the first end connected to the stem, the crook projecting upwards from the stem and then downwards towards the base in a substantially smooth curve ending at the hook tip;

the hook having a width, a height, and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane orientated parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where

the crook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip;

wherein the displacement volume of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-3} cc).

2. The hook of claim 1 wherein the crook height is less than 0.012 inches.

3. The hook of claim 1 wherein the thickness of the hook is less than 0.010 inches.

4. The hook of claim 1 wherein the footprint of the hook is less than 1.5×10^{-4} square inches.

5. A hook for a hook and loop fastening system comprising:

a base;

a stem connected at its lower end to the base, the stem having an outer side and inner side;

a crook having a first end and a hook tip, the first end connected to the stem, the crook projecting upwards from the stem and then downwards towards the base in a substantially smooth curve ending at the hook tip;

the hook having a width, a height and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane orientated parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the crook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip;

wherein the displacement volume of the hook is less than 4×10^{-6} cubic inches.

6. The hook of claim 5 wherein the crook height is less than 0.012 inches.

7. The hook of claim 5 wherein the thickness of the hook is less than 0.010 inches.

8. The hook of claim 5 wherein the footprint of the hook is less than 1.5×10^{-4} square inches.]

9. In a hook for a hook and loop fastener having a profile defined by an inner generally concave face and an outer generally convex face, the hook comprising a planar base member intimately engaging a tapered base portion and extending therefrom to join, in a transition region, a tapered hook portion able to engage a loop applying a force to the hook portion substantially normal to the planar base member and terminating in a free end, the taper of the hook portion being much less than the taper of the base portion wherein the hook tapers continuously downwardly in width from the tapered base portion to the free end such that a loop engaging the hook in tension, with the force being substantially normal to the planar base member, will cause the hinging or buckling of the hook at a location adjacent the outer face in the transition region as the hook deforms under the applied force and such that a loop engaging the hook in shear, with the force substantially parallel to the planar base member, will transmit bending force through the tapered base portion between the location of buckling and the planar base member, the hook being of substantially constant thickness and having a substantially rectangular traverse cross section and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane oriented parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the hook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip; wherein the volume displacement of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-5} cubic centimeters).

10. The hook according to claim 9 wherein the inner face in the transition region has an angle to the direction normal to the base member orientated to encourage a loop engaging the hook in shear to move toward the base member.

11. The hook according to claim 9 wherein the hook height of the hook is less than 0.012 inches.

12. The hook according to claim 9 wherein the inner generally concave face is so shaped as to encourage a loop engaging the hook in shear to engage the hook at about the location of buckling.

13. The hook portion of a hook and loop assembly comprising a multiplicity of hooks, having the configuration of the hook of claim 9 assembled into a multiplicity of hooks onto and extending from a common integral planar base.

14. The hook portion of a hook and loop assembly according to claim 13 wherein the multiplicity of hooks are aligned in a given direction so that adjacent rows of hooks face in opposite directions.

15. The hook portion of a hook and loop assembly according to claim 13 wherein the multiplicity of hooks are aligned in a given direction so that all hooks face in the same direction.

16. A plastic hook product for a hook and loop fastening system having hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less, the hook product comprising a multiplicity of plastic hooks in adjacent rows and extending from a common integral planar base, each of the multiplicity of hooks comprising:

5 a stem connected at its lower end to the base by being molded integrally with the base, the stem having
10 an outer side and an inner side;

a crook having a first end and a hook tip, the first end connected to the stem, the crook projecting upwards from the stem and then downwards towards the base in a substantially smooth curve ending at
15 the hook tip;

the hook having a width, a height, and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane orientated parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the crook achieves its maximum
20 distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane
25 perpendicular to the bottom plane and tangent to the outermost portion of the hook tip;
30 wherein the displacement volume of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-5} cc).

17. In a plastic hook product for a hook and loop fastener, the hook product having a multiplicity of plastic hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less, hooks of the multiplicity of hooks each having a profile defined by an inner generally concave face and an outer generally convex face, the hooks of the multiplicity of hooks each comprising a planar base member intimately engaging a tapered base portion, by being molded therewith, and extending there from to join, in a transition region, a tapered hook portion able to engage a loop applying a force to the hook portion substantially normal to the planar base member and terminating in a free end, the taper of the hook portion being much less than the taper of the base portion wherein the hook tapers continuously downwardly in width from the tapered base portion to the free end such that a loop engaging the hook in tension, with the force being substantially normal to the planar base member, will cause the hinging or buckling of the hook at a location adjacent the outer face in the transition region as the hook deforms under the applied force and such that a loop engaging the hook in shear, with the force substantially parallel to the planar base member, will transmit bending force through the tapered base portion between the location of buckling and the planar base member, the hook being of substantially constant thickness and having a substantially rectangular traverse cross section and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane oriented parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the hook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the

second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip; wherein the volume displacement of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-5} cubic centimeters),

- 5 the multiplicity of plastic hooks being in adjacent rows, a common integral planar base of said hook product being formed by base members of all of the multiplicity of plastic hooks.

20
18. A plastic hook product for a hook and loop fastening system having hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less, the hook product comprising a multiplicity of plastic hooks in adjacent rows facing in opposite directions and extending from a common integral planar base, each of the multiplicity of hooks comprising:

- 10 a stem connected at its lower end to the base by being molded integrally with the base, the stem having an outer side and an inner side;
- 15 a crook having a first end and a hook tip, the first end connected to the stem, the crook projecting upwards from the stem and then downwards towards the base in a substantially smooth curve ending at the hook tip;
- 20 the hook having a width, a height, and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane orientated parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the crook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip;
- 25 wherein the displacement volume of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-5} cc).
- 30

21 ~~19~~. A plastic hook product for a hook and loop fastening system having hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less, the hook product comprising a multiplicity of plastic hooks in adjacent rows and extending from a common integral planar base, each of the multiplicity of hooks comprising:

a stem connected at its lower end to the base by being molded integrally with the base, the stem having an outer side and an inner side;

a crook having a first end and a hook tip, the first end connected to the stem, the crook projecting upwards from the stem and then downwards towards the base in a substantially smooth curve ending at the hook tip;

the hook having a width, a height, and a displacement volume, wherein displacement volume is the volume of a rectangular parallelepiped having a bottom plane, first and second side planes, first and second end planes and a top plane; the bottom plane orientated parallel to the base and tangent to the hook tip, the top plane parallel to the base and tangent to the top of the hook at the point where the crook achieves its maximum distance from the base, the side planes laying in the plane of the sides of the hook; the first end plane perpendicular to the bottom plane at the point where the bottom plane intersects the stem at its outer side, the second end plane perpendicular to the bottom plane and tangent to the outermost portion of the hook tip;

wherein the displacement volume of the hook is less than 6×10^{-6} cubic inches (9.83×10^{-5} cc), the hook product being produced by the method comprising:

integrally molding the base and hooks using a molding roller having open-ended but otherwise closed

hook-shaped mold cavities in its periphery,
including filling the mold cavities with the base
in contact with the periphery, and
pulling the base progressively away from the periphery
 5 of the molding roller and progressively pulling
the hooks longitudinally from the mold cavities.

²²
~~20.~~ ^{16, 18 or 21} The hook product of any of claims ~~16-19~~ wherein
the displacement volume is less than 4×10^{-6} cubic inches.

²³
~~21.~~ ^{16, 18 or 21} The hook product of any of claims ~~16-19~~ wherein
 10 for each hook the crook height is less than 0.012 inches.

²⁴
~~22.~~ ^{16, 18 or 21} The hook product of any of claims ~~16-19~~ wherein
for each hook the thickness of the hook is less than 0.010
inches.

²⁵
~~23.~~ ^{16, 18 or 21} The hook product of any of claims ~~16-19~~ wherein
 15 the footprint of each hook is less than 1.5×10^{-4} square
inches.

¹⁸
~~24.~~ The hook product of claim 17 wherein the inner
face of the transition region has an angle to the direction
normal to the base member oriented to encourage a loop
 20 engaging the hook to move toward the base member.

¹⁹
~~25.~~ The hook product of claim 17 wherein the inner
generally concave face is so shaped as to encourage a loop
engaging the hook in shear to engage the hook at about the
location of buckling.

²¹
 25 26. The hook product of any of claims 16, 18 or ~~19~~
wherein the multiplicity of hooks face in the same
direction.

27. ²¹~~19~~ The hook product of any of claims 16, 18 or ~~19~~ wherein the hooks have differing orientations to provide multidirectional shear operation.

28. ²¹~~19~~ The hook product of claim ~~19~~, wherein the method
5 of producing the hook product further comprises, prior to pulling, cooling each of the hooks sufficiently to retain its shape without the aid of its mold cavity and to be sufficiently resilient to return to its desired shape after
10 being pulled longitudinally from its mold cavity while still being flexible enough to permit such removal without destructive stresses being reached in the hooks.

29. ²¹~~19~~ The hook product of claim ~~19~~, each hook being tapered and including concave fillets where the stem is connected to the base, the taper and the concave fillets
15 coupled with the generally arcuate shape of the crook portion providing removal easing clearances facilitating the removal of the hook from its mold cavity by pulling longitudinally from its mold cavity.

ABSTRACT

A plastic molded hook for use with a hook and loop fastening system especially adapted for use with low profile loops. The hook design includes a base, a stem and a crook whereby the volume of the portion of the hook penetrating into a pile of loops is defined as the displacement volume. Hooks especially adapted for use with low profile loops have a displacement volume of less than 6×10^{-6} cubic inches.

Fig. 1

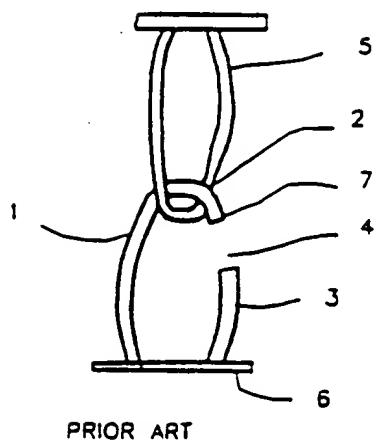


Fig. 2

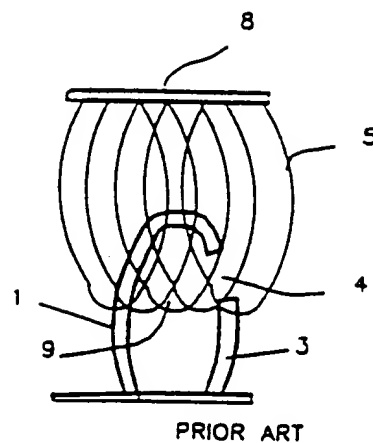


Fig. 3

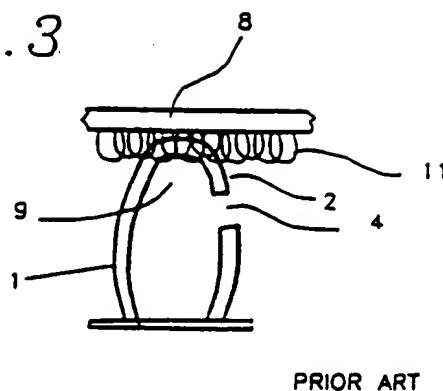


Fig. 4

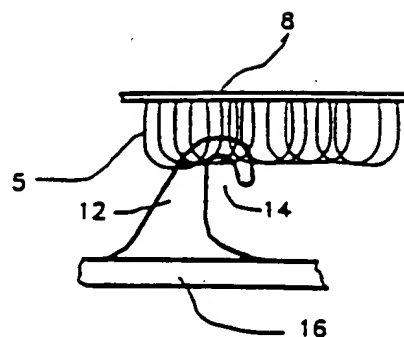
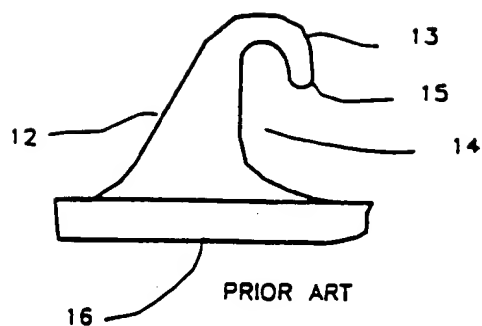


Fig. 5

Fig. 6

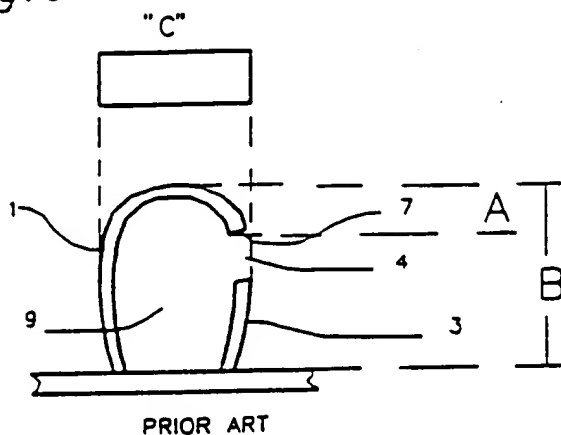


Fig. 7

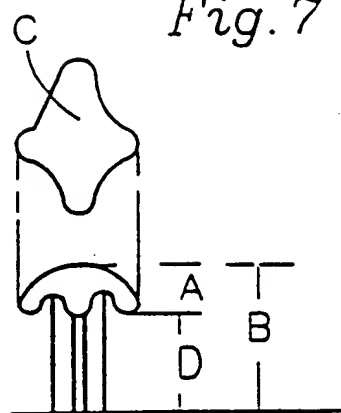


Fig. 8

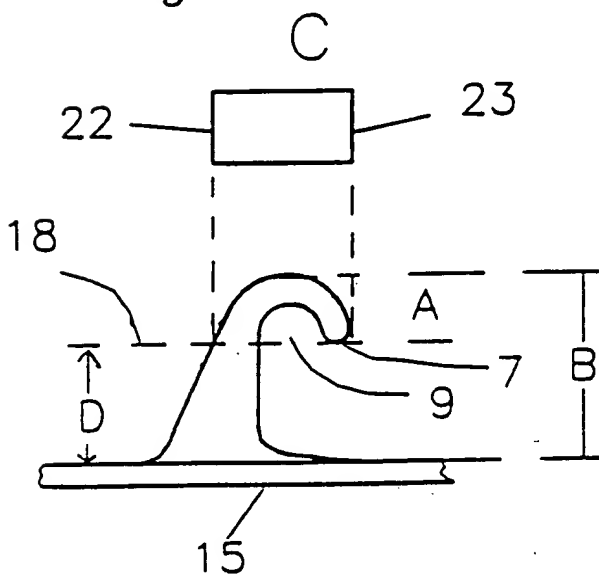


Fig. 9

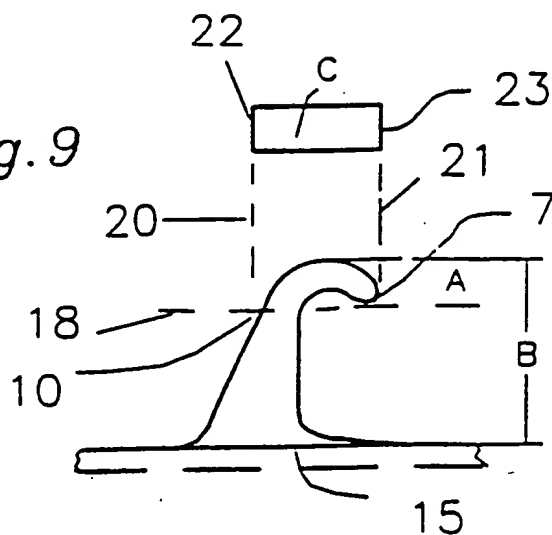


Fig. 10

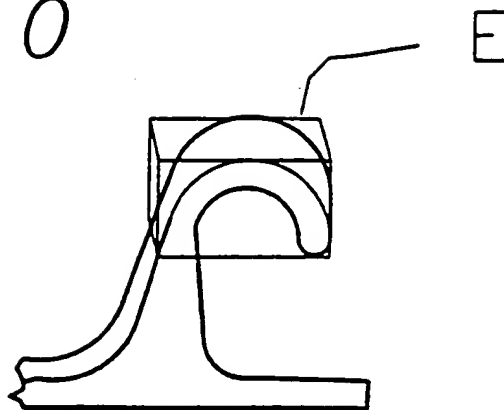


Fig. 11

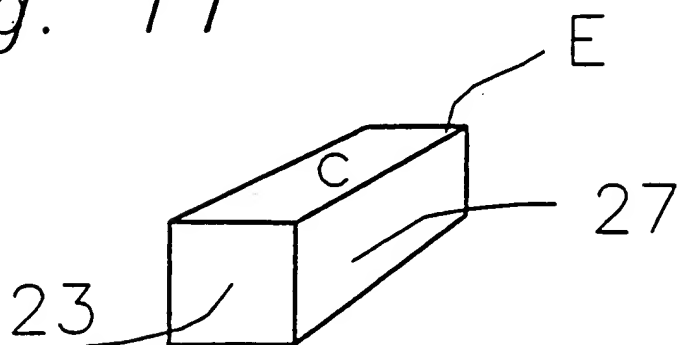
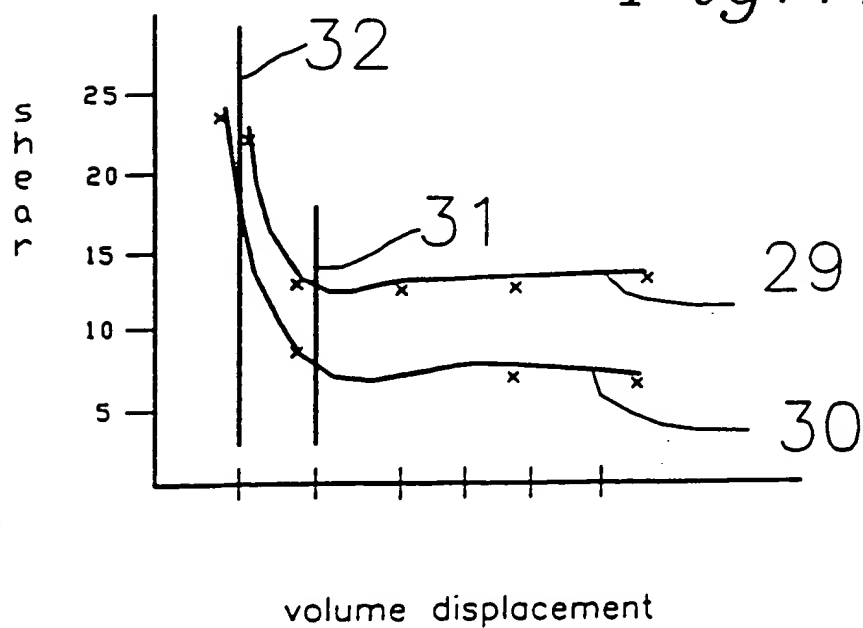


Fig. 12





PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Title : HOOK FOR HOOK AND LOOP FASTENER

Application for Reissue of U.S. Patent No. 5,315,740
Issued : May 31, 1994
BOX REISSUE PATENT APPLICATION
Assistant Commissioner of Patents
Washington, DC 20231

Declaration and Petition of George A. Provost
Pursuant to 35 U.S.C. §251 and
37 C.F.R. §1.171 et seq.

Sir:

I, George A. Provost, declare that I verily believe that I am the original, first and sole inventor of the subject matter which is described and claimed in a reissue application for Patent No. 5,315,740, issued May 31, 1994; that I have reviewed and understand the contents of the above-identified reissue application, including its specification and claims; that I acknowledge the duty to disclose all information of which I am aware which is material to the examination of this reissue application in accordance with Title 37, Code of Federal Regulation (C.F.R.), §1.56(a); that the aforesaid patent is partly inoperative by reason of my claiming more than I had a right to claim in the patent, and that said partial

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Date of Deposit June 4, 1997

I hereby certify under 37 CFR 1.10 that this correspondence is being deposited with the United States Postal Service as "Express Mail Post Office To Addressee" with sufficient postage on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Marche

KYRA MARCHE

inoperativeness is a result of error which arose without any deceptive intention.

The reissue application is attached hereto, with additions to be made by reissue underlined and deletions to be made by reissue bracketed.

As required by 37 C.F.R. §1.171, an order for a title report is enclosed. Also enclosed is an offer to surrender the original patent pursuant to 37 C.F.R. §1.178, and an assent to this reissue application by the assignee, Velcro Industries, B.V., pursuant to 37 C.F.R. §1.172.

The reasons which form the basis for this reissue application, and the resulting partial inoperativeness of the patent, can be summarized as follows:

U.S. Patent No. 5,315,740, for which reissue is applied, is a subject of Interference No. 103,718. On or about March 17, 1997, in the course of a prior art search related to the interference, U.S. Patent No. 4,999,067 to Erb, et al. came to the attention of an attorney of Fish & Richardson, P.C., which is counsel for the assignee of the subject patent. Neither I nor my attorney were aware of the Erb, et al. patent and its pertinence to certain of the claims of the subject patent when prosecuting the original patent application. Upon review of the Erb, et al. patent, it appears that the subject matter of claims 1-8 of the subject patent are either anticipated under Section 102 or made obvious under Section 103 of Title 35, United States

Code by the Erb, et al. patent, rendering these claims inoperable.

The Erb, et al. patent, which is cited in an Information Disclosure Statement accompanying the reissue application, discloses a method of making a hermaphrodite hook and loop fastener by first injection molding a plurality of thin, flat, hook ribbons. Each hook ribbon has a row of hooks in the plane of the ribbon and extending from one edge of the ribbon. A plurality of the hook ribbons are then positioned, side by side, on a separate substrate such that their hooks are oriented upstanding. Mounting projections on the bottom edges of the hook ribbons are then bonded to the substrate. The Erb, et al. patent, at column 7, Example 1, discloses hook dimensions which appear to render claims 1-8 of the subject patent inoperable. In particular, Example 1 discloses a hook thickness U of about 0.004 inches, a hook width B' of about 0.024 inches, and a dependency of hook head C' of about 0.019 inches. These dimensions provide a hook displacement volume of about 1.8×10^{-6} cubic inches.

In the reissue application, claims 1-8 are deleted, and claims 9-15 are unchanged. New claims 16-29 are presented for the first time in the reissue application. Each of claims 16-29 recites all the limitations that are recited in at least one of the claims of the subject patent, and recites additional features which distinguish over the Erb, et al. patent. The additional limitations in claims 16-29, beyond what was recited in the

claims of the subject patent, are found in the specification and claims of the subject patent. The specification includes the disclosure of U.S. Patent No. 4,984,339, which is specifically incorporated by reference in the subject patent at column 4, lines 19-23:

"FIG. 4 shows a cross section of a plastic molded hook, formed by plastic molding techniques in desired shapes as disclosed in U.S. Patent No. 4,984,339 assigned to the owner of the instant invention and incorporated by reference herein." (emphasis added).

A copy of Patent No. 4,984,339 is attached hereto as exhibit A. Claims 16-29 do not add any new matter.

New claims 16-19 are the only independent claims in the reissue application. Claims 16, 18 and 19 each recite a hook product having a "multiplicity of hooks in adjacent rows and extending from a common integral planar base," wherein the stem of each hook is "connected at its lower end to the base by being molded integrally with the base." This feature distinguishes over the Erb, et al. patent. The hook product having adjacent rows of hooks that is disclosed in the Erb, et al. patent does not have a common integral planar base with hook stems being molded integrally to the base, as required by claims 16, 18 and 19, but rather is formed by joining separately molded hook ribbons to a separate substrate.

Claim 17 recites a tapered hook shape, which is not disclosed by the Erb, et al. patent. In addition, claim 17

recites a "multiplicity of plastic hooks being in adjacent rows," "hooks of the multiplicity of hooks comprising a planar base member intimately engaging a tapered base, by being molded therewith," and "a common integral planar base . . . being formed by base members of all the multiplicity of plastic hooks." These features also distinguish over the Erb, et al patent.

Claim 16 includes all the limitations recited in claim 1 in the context of a plastic hook product for a hook and loop fastening system having hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less, the hook product comprising a multiplicity of hooks in adjacent rows extending from a common integral planar base, each of the multiplicity of hooks comprising a stem connected at its lower end to the base by being molded integrally with the base. Support for the recitation of "A plastic hook product for a hook and loop fastening system" is found in the specification of the subject patent at column 6, line 39:

" . . . advanced hook products;"

at column 6, line 40,

" . . . plastic molded hooks;"

and in claim 1,

"A hook for a hook and loop fastening system
"

Support for "having hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less" is found in the specification at column 2, lines 53-54:

" . . . in which the size and shape of the hook is especially suited to low level loops;"

at column 5, lines 43-46,

" . . . hooks engaged in a low profile loop closure system . . . having loop height of approximately 0.040 inches;"

and at column 6, lines 40-43,

" . . . plastic molded hooks . . . engage especially well in loops with a pile height of less than 0.025 inches."

Support for "the hook product comprising a multiplicity of hooks in adjacent rows extending from a common integral planar base" is found in claim 13:

" . . . a multiplicity of hooks onto and extending from a common integral planar base;"

in claim 14

" . . . adjacent rows of hooks;"

and in Fig. 23 of Patent No. 4,984,339, which is shown in Exhibit A attached hereto. Support for "a stem connected at its lower end to the base" can be found in claim 1 of the subject patent, at column 6, line 54:

" . . . a stem connected at its lower end to the base"

Support for "by being molded integrally with the base" is found in the specification of the subject patent:

"A plastic molded hook . . ." (Abstract);

"This invention relates . . . particularly to plastic molded hooks intended for use with low pile loops." (column 1, lines 5-7)

"Fig. 4 shows a cross section of a plastic molded hook, formed by plastic molding techniques in desired shapes as disclosed in U.S. Patent No. 4,984,339 . . . incorporated by reference herein." (column 4, lines 19-23);

". . . molded hook . . ." (column 4, lines 35-36); and

". . . the molding process for making that hook [shape of U.S. Patent No. 4,984,339] is easily adjusted . . . to produce hooks in the preferred range of displacement . . ." (column 6, lines 6-7);

and in Figs. 11-16 of Patent No. 4,984,339, which illustrate a hook 20 being molded integrally with a contiguous surface of planar base member 24. The molding process is described at column 6, lines 7-9 of Patent No. 4,984,339:

"FIG. 11 shows a hook 20 filling a hook cavity 46 in the periphery 48 of a molding roller 50 with base member 24 in contact with the periphery 48. Once the hook (and base member) has cooled sufficiently to . . . to be sufficiently resilient to return to its desired shape after being pulled longitudinally from the mold . . . the base member is pulled progressively away from the periphery of the molding roll and the hook is pulled progressively from the mold as shown sequentially in FIGS. 12 through 15 until it clears the cavity and springs back to the desired shape as shown in FIG. 16.1"

Support for the remainder of claim 16, from line 9 onwards, is found in claim 1 of the subject patent, starting at column 6, lines 54-55, with:

"the stem having an outer side and an inner side . . . "

to the end of claim 1.

Claim 17 includes all the limitations recited in claim 9 in the context of a plastic hook product for a hook and loop fastener, the hook product having a multiplicity of plastic hooks sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less, hooks of the multiplicity of hooks each comprising a planar base member intimately engaging a tapered base portion, by being molded therewith, and extending there from to join, in a transition region, a tapered hook portion, the multiplicity of plastic hooks being in adjacent rows, a common integral planar base being formed by base members of all of the multiplicity of plastic hooks. The remainder of claim 17, lines 11-43 inclusive, is identical to claim 9, beginning in the subject patent at column 7, line 54 ("tapered hook portion . . ."), to the end of claim 9.

Support for the above-recited limitations is found in claim 9 of the subject patent, and in the specification and other claims of the subject patent and in Patent No. 4,984,339. Specific support for "In a plastic hook product for a hook and

loop fastener" is found in the specification of the subject patent at column 6, line 39:

" . . . advanced hook products;"

at column 6, line 40,

" . . . plastic molded hooks;"

and in claim 9,

"In a hook for a hook and loop faster . . .
."

Support for "the hook product having a multiplicity of plastic hooks" is found in claim 13:

" . . . a multiplicity of hooks"

Support for "sized and shaped to be capable of engaging loops of a loop product with a pile height of approximately 0.04 inches or less" is found in the specification at column 2, lines 53-54:

" . . . in which the size and shape of the
hook is especially suited to low level
loops;"

at column 5, lines 43-46,

" . . . hooks engaged in a low profile loop
closure system . . . having loop height of
approximately 0.040 inches;"

and at column 6, lines 40-43,

" . . . plastic molded hooks . . . engage
especially well in loops with a pile height
of less than 0.025 inches."

Support for "hooks of the multiplicity of hooks each having a profile defined by . . . a planar base member intimately engaging a tapered base portion" is found in claim 9 at column 7, lines

49-53. Support for "by being molded therewith" is found in the specification of the subject patent:

"A plastic molded hook . . ." (Abstract);

"This invention relates . . . particularly to plastic molded hooks intended for use with low pile loops." (column 1, lines 5-7)

"Fig. 4 shows a cross section of a plastic molded hook, formed by plastic molding techniques in desired shapes as disclosed in U.S. Patent No. 4,984,339 . . . incorporated by reference herein." (column 4, lines 19-23);

". . . molded hook . . ." (column 4, lines 35-36); and

". . . the molding process for making that hook [shape of U.S. Patent No. 4,984,339] is easily adjusted . . . to produce hooks in the preferred range of displacement . . ." (column 6, lines 6-7);

and in Figs. 11-16 of Patent No. 4,984,339, which illustrate a hook 20 being molded integrally with a contiguous surface of planar base member 24. The molding process is described at column 6, lines 7-35 of Patent No. 4,984,339:

"FIG. 11 shows a hook 20 filling a hook cavity 46 in the periphery 48 of a molding roller 50 with base member 24 in contact with the periphery 48. . . the base member is pulled progressively away from the periphery of the molding roll and the hook is pulled progressively from the mold as shown sequentially in FIGS. 12 through 15 until it clears the cavity and springs back to the desired shape as shown in FIG. 16."

Support for the remainder of claim 17, lines 10-41 inclusive, is found in claim 9, beginning in the subject patent at column 7,

line 53 ("and extending there from to join . . ."), to the end of claim 9 at column 8, line 31. In the last paragraph of claim 17, support for "the multiplicity of plastic hooks being in adjacent rows" is found in claim 14:

" . . . the multiplicity of hooks are aligned in a given direction so that adjacent rows of hooks;"

and in Fig. 23 of Patent No. 4,984,339. Support for "a common integral planar base of said hook product being formed of all the multiplicity of plastic hooks" is found in the subject patent at claim 13:

" . . . a multiplicity of hooks onto and extending from a common integral planar base;"

and in Fig. 23 of Patent No. 4,984,339, which is reproduced in Exhibit A.

Claim 18 includes all the limitations of claim 16, the support for which is discussed above, and also recites the "multiplicity of plastic hooks in adjacent rows facing in opposite directions." Support is found in claim 14 of the subject patent, at column 8, lines 49-51:

" . . . the multiplicity of hooks are aligned in a given direction so that adjacent rows of hooks face in opposite directions."

Claim 19 includes all of the limitations of claim 16, and also recites the hook product being produced by the method comprising integrally molding the planar base and hooks using a molding roller having open-ended but otherwise closed hook-shaped

mold cavities in its periphery, including filling the mold cavities with the planar base in contact with the periphery, and pulling the planar base progressively away from the periphery of the molding roller and progressively pulling the hooks longitudinally from the mold cavities. Support for these limitations can be found in Patent No. 4,984,339, at Figs. 11-15 and at column 5, line 68 through column 6, line 34:

" . . . hook which is shaped and dimensioned to be readily pulled from an open ended but otherwise closed hook shaped cavity . . . FIGS. 11 through 16 illustrate this removal process step-by-step.

"FIG. 11 shows a hook 20 filling a hook cavity 46 in the periphery 48 of a molding roller 50 with base member 24 in contact with the periphery 48. Once the hook (and base member) has cooled sufficiently to . . . to be sufficiently resilient to return to its desired shape after being pulled longitudinally from the mold . . . the base member is pulled progressively away from the periphery of the molding roll and the hook is pulled progressively from the mold as shown sequentially in FIGS. 12 through 15 until it clears the cavity and springs back to the desired shape as shown in FIG. 16."

Claim 20 recites, in the context of the hook product of any of claims 16-19, that the displacement volume is less than 4×10^{-6} cubic inches. This limitation is in the last two lines of claim 5 of the subject patent.

Claims 21, 22, and 23 recite, in the context of the hook product of any of claims 16-19, limitations respectively found in claims 2, 3, and 4 of the subject patent.

Claims 24 and 25 recite, in the context of claim 17, limitations respectively found in claims 10 and 11 of the subject patent.

In the context of any of claims 16, 18 or 19, claim 26 recites that the multiplicity of hooks face in the same direction. Support for this limitation is found at claim 15 of the subject patent:

" . . . all hooks face in the same direction."

Claim 27, also in the context of any of claims 16, 18 or 19, recites that the hooks have differing orientations to provide multidirectional shear operation. This limitation can be found in Patent No. 4,984,339, at column 8, lines 55-56:

" . . . the hooks may have differing orientations to provide multidirectional shear operation."

Claim 28 recites that the method of producing the hook product of claim 19 further comprises, prior to pulling, cooling each of the hooks sufficiently to retain its shape without the aid of its mold cavity and to be sufficiently resilient to return to its desired shape after being pulled longitudinally from its mold cavity while still being flexible enough to permit such removal without destructive stresses being reached in the hooks. Support can be found in Patent No. 4,984,339 at column 8, lines 10-30:

"Once the hook (and base member) has cooled sufficiently to retain its shape without the aid of the cavity and to be sufficiently

resilient to return to its desired shape after being pulled longitudinally from the mold while still being flexible enough to permit such removal without destructive stresses being reached in the hook"

Claim 29 recites, in the context of the hook product of claim 19, each hook being tapered and including concave fillets where the stem is connected to the base, the taper and the concave fillets coupled with the generally arcuate shape of the crook portion providing removal easing clearances facilitating the removal of the hook from its mold cavity by pulling longitudinally from its mold cavity. Support for this limitation is found in Patent No. 4,984,339 at column 8, lines 37-42:

" . . . the choice of taper of the hook and the concave shape of the fillets coupled with the generally arcuate shape of the hook portion contribute to providing removal easing clearances facilitating the removal of the hook;"

and at column 6, lines 12-13

" . . . pulled longitudinally from the mold"

I hereby appoint the following attorneys and/or agents to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith: John N. Williams, Reg. No. 18,948; Jonathan J. Wainer, Reg. No. 36,712; Willis M. Ertman, Reg. No. 18,658; William E. Booth, Reg. No. 28,933; John W. Freeman, Reg. No. 29,066; Timothy A. French, Reg. No. 30,175; Alan H. Gordon, Reg. No. 26,168; John F. Land, Reg. No. 29,554; John B. Pegram, Reg. No. 25,198; Rene D. Tegtmeyer,

Reg. No. 33,567; Hans R. Troesch, Reg. No. 36,950; Dorothy P. Whelan, Reg. No. 33,814; Charles C. Winchester, Reg. No. 21,040.

Please address all telephone calls to John N. Williams at telephone number 617/542-5070.

Please address all correspondence to John N. Williams, Fish & Richardson P.C., 225 Franklin Street, Boston, MA 02110-2804.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Date:

June 2, 1997


George A. Provost

242878.B11



PATENT
ATTORNEY DOCKET NO. 5918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Title : HOOK FOR HOOK AND LOOP FASTENER

Application for Reissue of U.S. Patent No. 5,315,740
Issued : May 31, 1994

BOX REISSUE APPLICATION
Assistant Commissioner for Patents
Washington, DC 20231

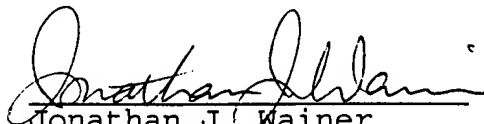
ORDER FOR TITLE REPORT

Pursuant to 37 C.F.R. §1.171, an order for a title report on the above-identified U.S. Patent is hereby made, to be placed in the file of the above-identified application for reissue.

Please charge Deposit Account No. 06-1050 for the required fee. A duplicate copy of this order is attached for accounting purposes.

Respectfully submitted,

Date: June 4, 1997

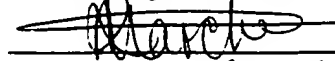

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242878.B11

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MARCHE



PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Title : HOOK FOR HOOK AND LOOP FASTENER

Application for Reissue of U.S. Patent No. 5,315,740
Issued : May 31, 1994

BOX REISSUE APPLICATION
Assistant Commissioner of Patents
Washington, DC 20231

ASSENT BY ASSIGNEE

Under 37 CFR §3.73(b), Velcro Industries, B.V., a corporation of the Netherlands, certifies that it is the assignee of the entire right, title and interest in the patent identified above by virtue of an assignment from the inventor. The assignment was recorded in the Patent and Trademark Office at Reel 6242, Frame 0883 on August 20, 1992.

The undersigned has reviewed all the documents in the chain of title of the patent, and, to the best of undersigned's knowledge and belief, title is in the assignee identified above.

The undersigned, whose title is supplied below, is empowered to act on behalf of the assignee.

The undersigned, acting on behalf of the assignee, hereby offers to surrender the above-identified Letters Patent, and assents to the accompanying reissue application.

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Date of Deposit June 4, 1997

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Kyrle Marche

KYRLE MARCHE



I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patents issued thereon.

Date: May 27, 1997

VELCRO INDUSTRIES, B.V.

By: 

Name: PCA van Sambeek-Ronde
Its : Managing Director

242878.B11



PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Title : HOOK FOR HOOK AND LOOP FASTENER

Application for Reissue of U.S. Patent No. 5,315,740
Issued : May 31, 1994

Commissioner of Patents and Trademarks
Washington, DC 20231

OFFER TO SURRENDER

I, George A. Provost, sole inventor for the above-captioned U.S. Letters Patent, which is the subject of the accompanying application for reissue, hereby offer to surrender the above-captioned U.S. Letters Patent.

Date: June 2, 1997

George A. Provost
George A. Provost

242878.B11

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KYRA MARCHE
KYRA MARCHE



EXHIBIT A

United States Patent [19]
Provost et al.

[11] Patent Number: 4,984,339
[45] Date of Patent: Jan. 15, 1991

[54] HOOK FOR HOOK AND LOOP FASTENERS

[75] Inventors: George A. Provost, Manchester;
Gerald F. Rocha, Bedford, both of
N.H.

[73] Assignee: Velcro Industries B.V., Amsterdam,
Netherlands

[21] Appl. No.: 262,474

[22] Filed: Oct. 20, 1988

[51] Int. Cl.³ A44B 13/00
[52] U.S. Cl. 24/452; 24/442
[58] Field of Search 24/452, 450, 449, 442,
24/443, 451; 428/100

[56] References Cited

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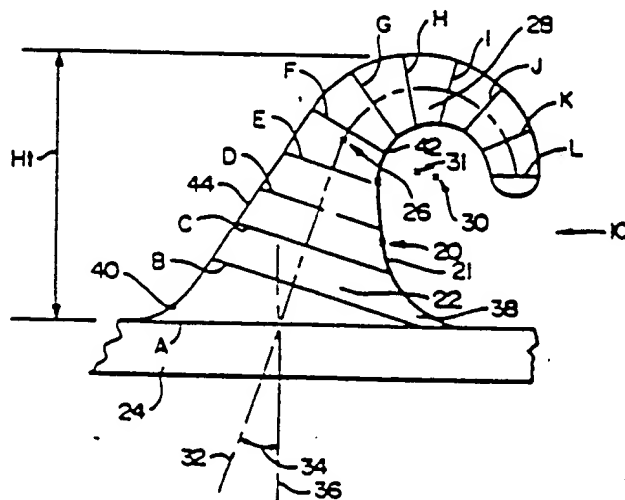
2929329 2/1981 Fed. Rep. of Germany 24/452
WO87/06522 11/1987 PCT Int'l Appl. .

Primary Examiner—James R. Brittain
Attorney, Agent, or Firm—Hayes, Soloway, Hennessey
& Hage

[57] ABSTRACT

An improved hook for hook and loop fasteners having a profile defined by an inner smoothly contoured generally concave face and an outer generally convex face, said hook comprising a sturdy base intimately engaging a substantially planar base member and extending therefrom to join a resilient hook portion, able to engage a loop applying a force to the hook portion substantially normal to the base member, terminating in a free end, wherein the hook tapers smoothly and continuously downwardly in width from the sturdy base member to the free end such that a loop engaging the hook in tension, with the applied force being substantially normal to the base member, will deform the hook portion resiliently under the applied force to release the loop at a desired applied force and such that a loop engaging the hook in shear, with the applied force substantially parallel to the base member, will engage the sturdy base member, the sturdy base member being sufficiently sturdy that it will not deform to release a loop engaging the hook in shear at or below the desired applied force.

28 Claims, 7 Drawing Sheets



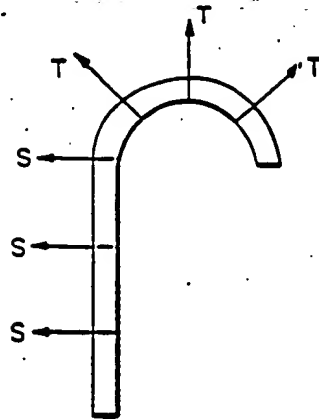


FIG. 1
PRIOR ART

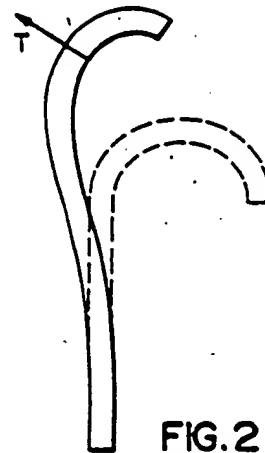


FIG. 2
PRIOR ART

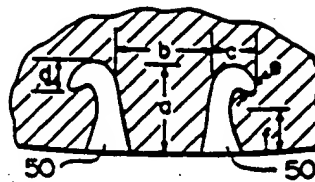


FIG. 3
PRIOR ART

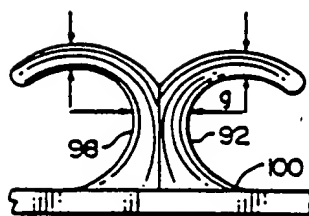


FIG. 4
PRIOR ART

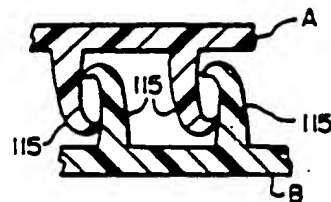


FIG. 5
PRIOR ART

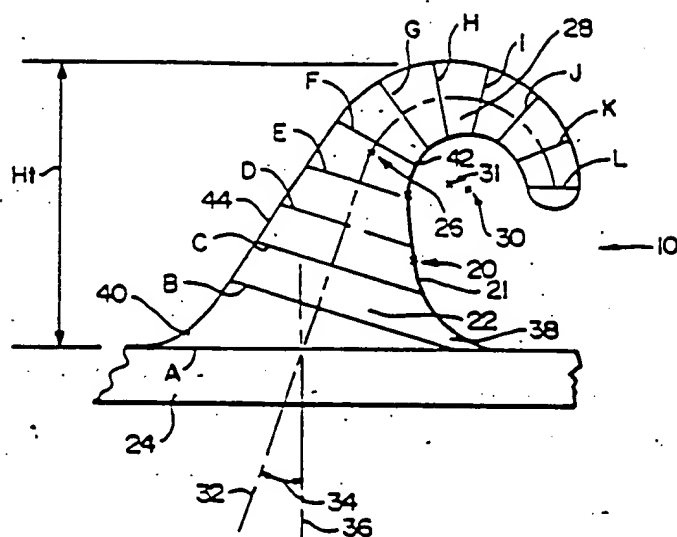


FIG. 6

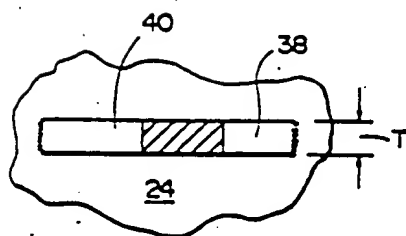


FIG. 7

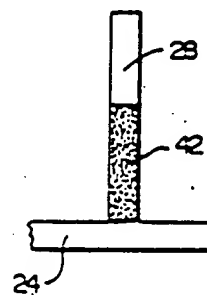
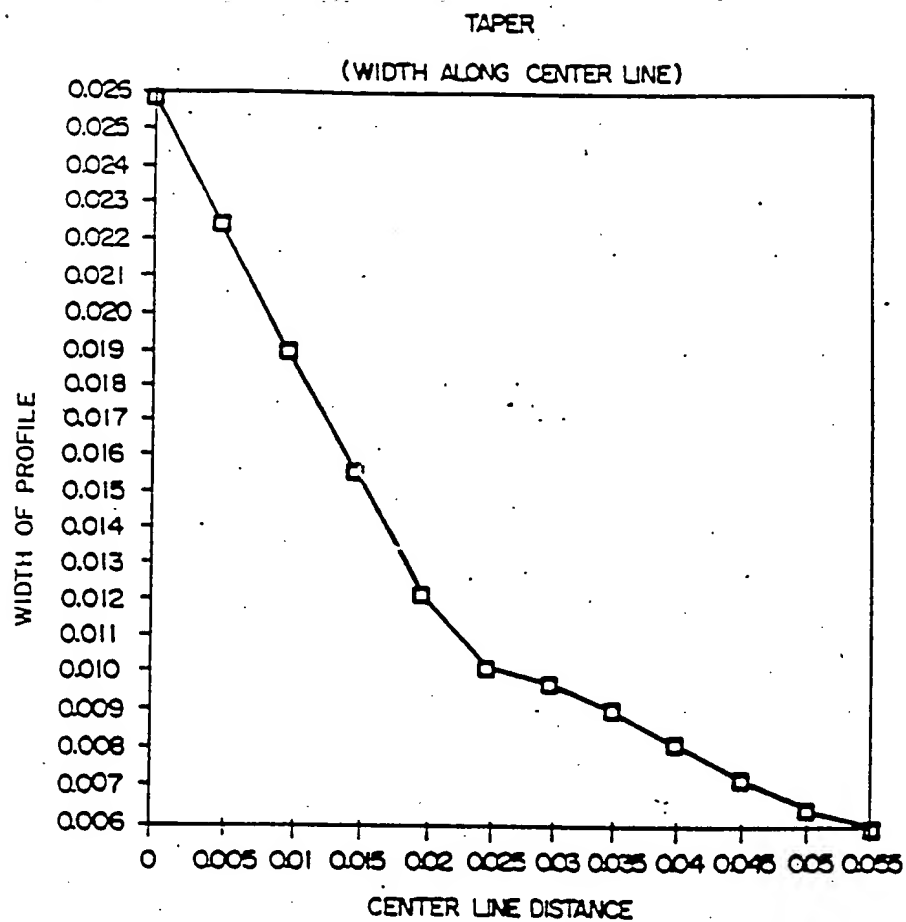
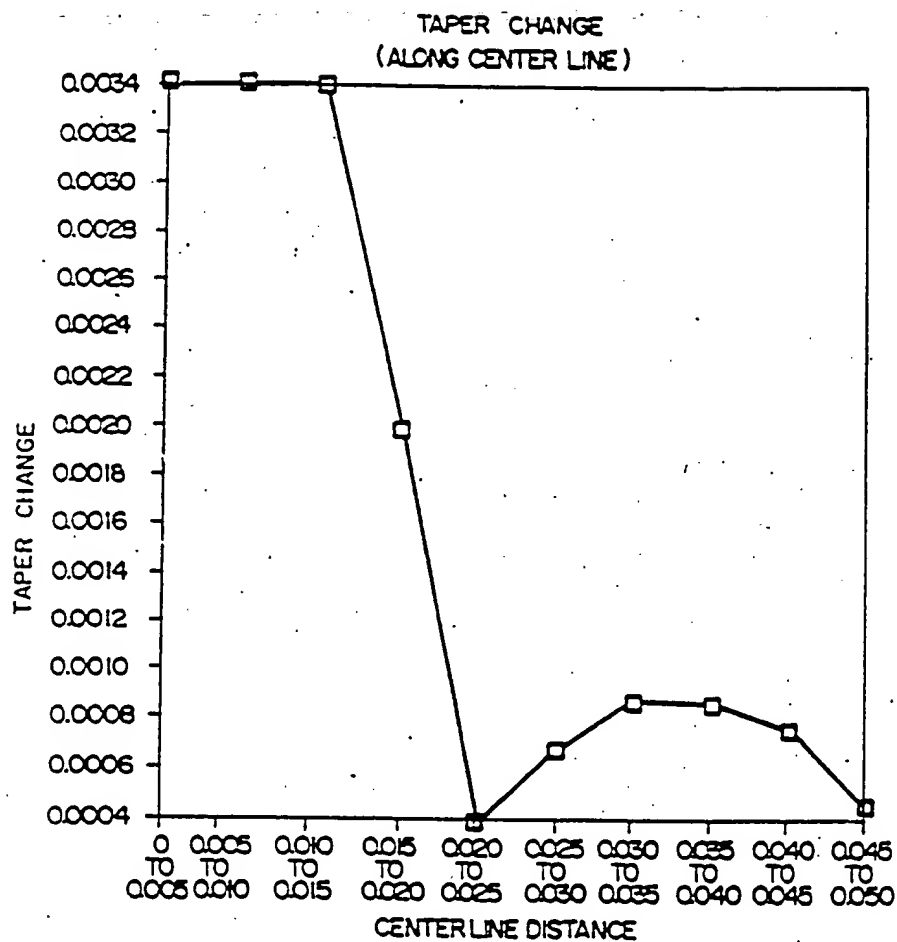


FIG. 8

FIG. 9

FIG. 10

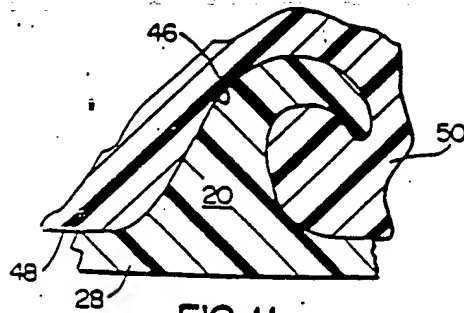


FIG. 11

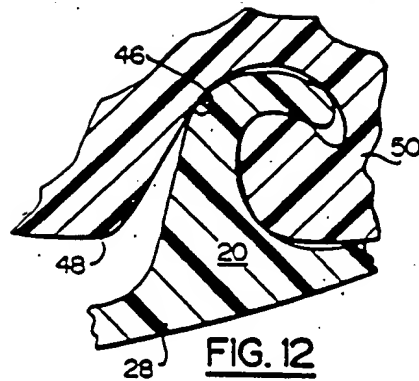


FIG. 12

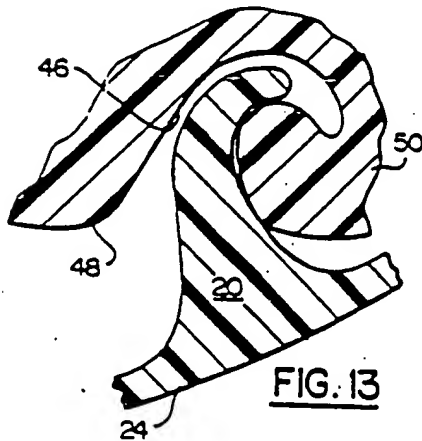


FIG. 13

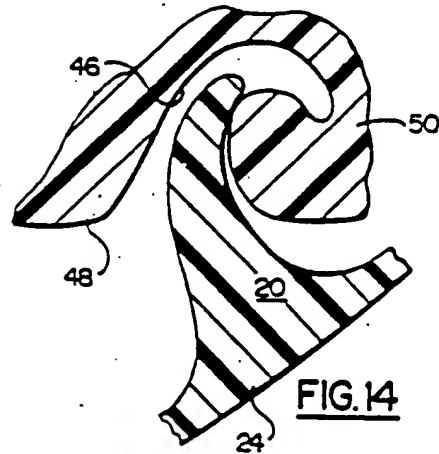


FIG. 14

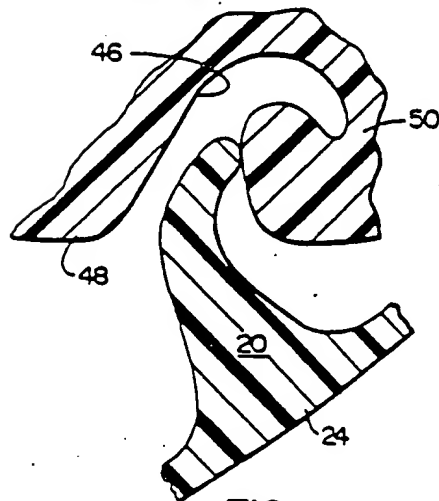


FIG. 15

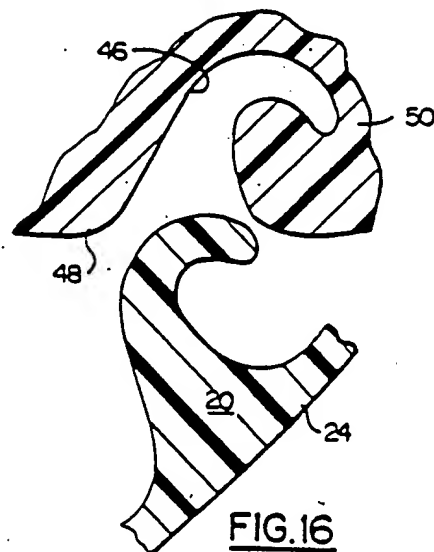


FIG. 16

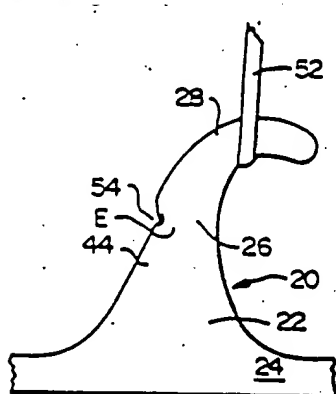


FIG. 17

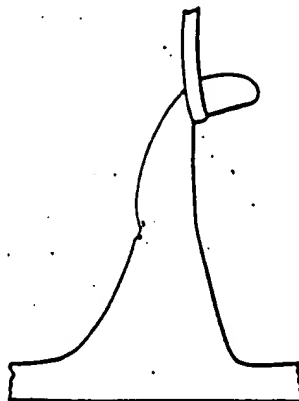


FIG. 18

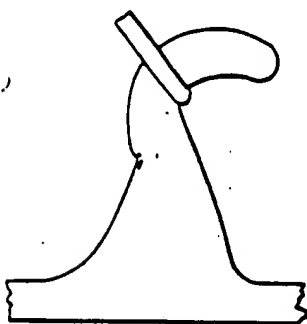


FIG. 19

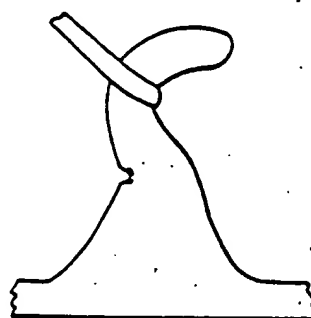


FIG. 20

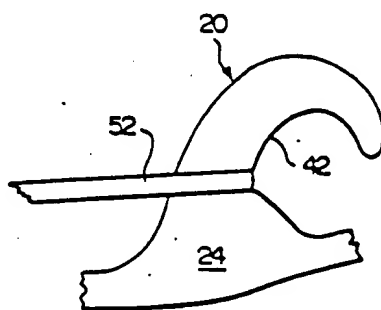


FIG. 21

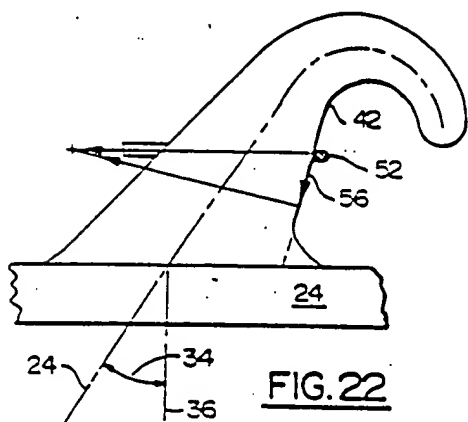


FIG. 22

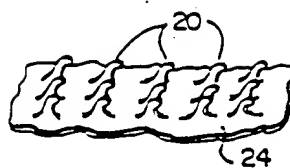


FIG. 23

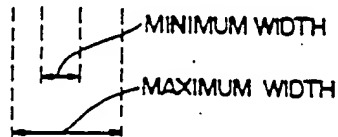
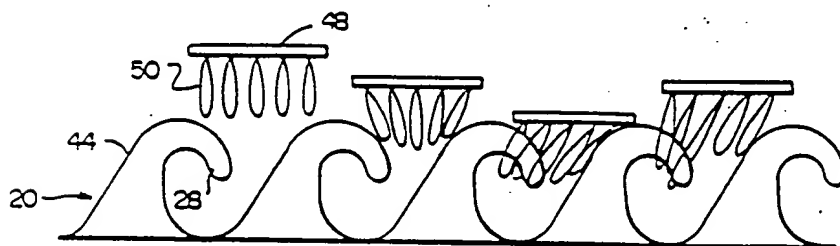


FIG. 24

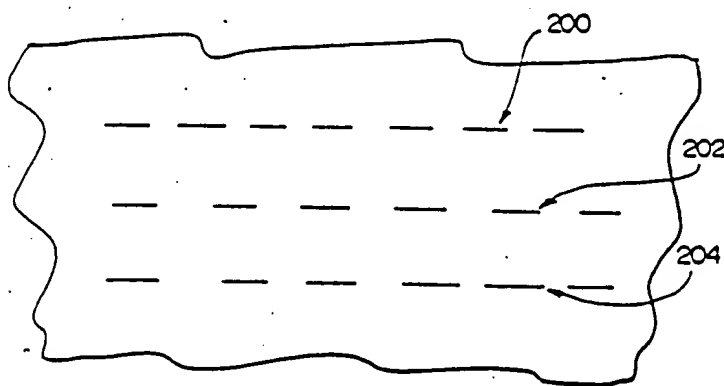


FIG. 25

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FOR HOOK AND LOOP FASTENERS

This invention relates to an improved hook for hook and loop fasteners and particularly, though not exclusively, to such hooks integrally molded with a base strip and having a cross-section with a shape to facilitate removal from an open-ended but otherwise closed mold cavity as the base strip is peeled from the periphery of a roller having said cavities formed in the periphery thereof and to provide high shear strength for the fastener coupled with desired relatively low hook height, satisfactory separability performance for the fastener in peel, appropriate automatic positioning of a loop engaging the hook for operation in tension and in shear, superior engagement of the loop with the hook for operation in shear, low lint pickup during washing and superior anti-magging properties and reduced surface abrasion of adjacent fabric surfaces all relative to prior art hook and loop fastener hooks.

The technology for hook and loop fasteners is well established, however, this conventional technology has limitations which restrict performance. With consideration for these limitations, the hook of the present invention has been developed to optimize hook geometry and thus improve performance.

Typically hook and loop fasteners derive their fastening ability from the mechanical engagement of hooking elements with yarn filaments anchored at both ends in a base material. The conventional construction for the hook portion of such a fastener involves inverted "J" shaped protrusions of uniform cross-section extending perpendicularly from a base member. This structure is typically achieved by weaving or knitting synthetic monofilament yarns into a base ribbon.

As a fastener, the hook and loop closure is subjected to various types of stresses. Opposing loads applied perpendicular to the faces of the hook and loop elements are identified as tension forces. Opposing loads applied parallel to and in the same plane as the faces are shear forces. Those required to disengage the elements are peel forces. FIG. 1 illustrates a conventional hook and indicates the location and direction of these forces.

FIG. 2 depicts the typical deformation that a conventional hook experiences under peel and shear loads respectively. The strength of the fastener under these type loadings is directly proportional to the hook's resistance to deformation. For conventional monofilamenting hooks this can be only altered by varying the monofilament diameter or resin. These modifications are limited in scope and can be more detrimental than beneficial on performance.

Because of mechanical limitations in producing the monofilament hook, its minimum height typically is restricted to 0.070 ± 0.005 ". When shear loads are applied to this hook configuration deformation causes the loop filament applying the force to slide up the hook shank increasing the length of the moment arm which results in greater deformation causing further slippage and subsequently a longer moment arm. Ultimately the filament slips off the hook end.

Basically the same type of failure occurs when peel or tension loads T are applied as shown in FIG. 2.

Attempts have been made in the past to produce molded hooks integrally formed with a base strip. Generally these have varied in configuration either to meet specific manufacturing criteria (e.g. MENZIN U.S. Pat. No. 3,762,000) or have been shaped to imitate the well-

known monofilament hook shown in FIG. 1. (e.g. ERBS U.S. Pat. No. 3,147,528).

U.S. Pat. No. 3,760,000 to Menzin et al., disclose a hook "eye" having a sloping surface which functions as a cam surface during the extracting of the hooks from the mold cavities. The shank portion has two equally dimensioned flat sides and a somewhat larger third side. The shank portion is larger in cross section near the web than at the tip of the hook. The three flat side portions of the shank are continued in smooth curves into and throughout the hook portion. The shank portion of the third side lies in the same continuous plane as the corresponding face of hook portion.

Several other disclosures in the prior art such as U.S. Pat. Nos. 3,312,583 (Rochlis) and 3,708,833 (Ribich) describe hooks having somewhat tapered shapes. None of these embodiments, however, discuss the unique structure of the present invention or provide the advantages achieved by the present invention.

A more recent arrangement (see i.e. PCT/U.S. No. 86/01367 published Nov. 5, 1987) proposes the integral molding of hooks and base strip using a molding roller having hook shaped open ended non-openable cavities extending into the periphery thereof with the hooks molded therein being pulled longitudinally from the cavities as the base strip is peeled away from the roller. This PCT application discusses a variety of single and double hook configurations primarily directed at shapes that will facilitate withdrawal of the hooks from the open ended molds formed in the sides of a plurality of discs, at the perimeter thereof, that form the molding roller.

A first of these has a base member having a typical hook-type engaging element, upstanding from one surface thereof, formed of an upstanding stem which is preferably tapered and which includes an arcuately configured inner surface. On the unsupported end of the stem there is connected a radial extension which extends away from the stem and is resiliently flexible relative to the stem.

The stem is tapered from the base to its unsupported end. The radial extension flexes mechanically and resiliently relative to the stem when the fastener members are pressed together or peeled apart thus permitting the relative peeling of the fastener members. Whenever shear forces are applied to the two members, these forces cause further engagement between the loop and the hook by translation of downward forces on the loop thereby causing the loop to ride downwardly along the arcuate surface of the hook. Thus, it will be appreciated that the configuration of the hook with its unique arcuate inner surface portion, assists in directing any loops engaged therewith toward a predetermined portion of the stem, in this case, the medial portion of the stem which is the portion of greatest strength.

This PCT application points out that by carefully and precisely dimensioning the stem of each hook in its cross-section and its arcuate side portion, the strength of the stem in the fastener shear mode can be increased or decreased depending upon its cross-sectional area, and consequently to adjust its strength in shear. In particular, it is stated that since the arcuate portion of the stem will normally direct the loop or loops to a predetermined portion when in shear, it will be observed that the strength of the fastener in shear can be predetermined by carefully selecting the cross-sectional area of the stem, not only at its base but at its medial section, i.e. the section which will receive the hook or loops when

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they slide along the arcuate stem portion when the fastener is in the shear mode.

A second hook of this PCT application is tapered and has arcuate inner and outer surfaces to facilitate the predetermination of the shear strength capability of the hook.

The stem of this embodiment is connected to the base member by arcuate reinforcing transitions. These hook designs are all part circular, is cross-sectional and may be provided with a taper not only in width but also in thickness.

It is an object of the present invention to provide an improved molded hook shaped to provide superior performance to prior art molded hooks in hook and loop fasteners while facilitating economical production.

It is a further object of the present invention to provide a hook shape for hook and loop fasteners which minimizes lint pick-up and snagging while maximizing the grip of the loop on the hook together with desired performance in peel coupled with desired performance in shear.

According to the present invention there is provided an improved hook for hook and loop fasteners having a profile defined by an inner generally concave face and an outer generally convex face, said hook comprising a steeply tapered base portion intimately engaging a planar base member and extending therefrom. The tapered base portion joins, in a transition region, a hook portion able to engage a loop in the hook tapering continuously downwardly in width from the base member to the free end. A loop engaging the hook in tension, with the said force being substantially normal to the base member, will cause a buckling of the hook at a location adjacent the outer face in the transition region as the hook deforms under the applied force. A loop engaging the hook in shear, with said force substantially parallel to the base member, will transmit the shear force through the hook at a point between the location of buckling and the base member. Thus the shear force is transmitted through the steeply tapered (much stronger) base portion.

The invention will now be described, by way of example, with reference to the accompanying drawings, in which:

FIGS. 1, and 2, illustrate a prior art monofilament hook and its operation;

FIGS. 3 and 4 illustrate two types of hooks illustrated in the PCT application and FIG. 5 illustrates a hook of the type shown in Rochlis U.S. Pat. No. 3,312,583.

FIG. 6 is a side elevation of a preferred shape of hook according to the present invention;

FIG. 7 is a typical cross-section of the hook of FIG. 6;

FIG. 8 a front elevation of the hook of FIG. 6 as seen in the direction of arrow 10 in FIG. 6;

FIG. 9 is a graphical representation of the continuous taper of the hook of FIG. 6;

FIG. 10 is a graphical representation of the change of taper of the hook of FIG. 6;

FIGS. 11 through 16 illustrate the removal of the hook of FIG. 6 from an open-ended cavity in the periphery of a molding roller as a base member of hook material, by which a plurality of the hooks are supported, is peeled from the roller surface;

FIGS. 17 and 18 illustrate the deformation under medium and near release loads by a loop engaging the hook of FIG. 6 in tension;

FIGS. 19 and 20 illustrate the deformation under medium and near release loads by a loop engaging the hook of FIG. 6 angled toward shear operation but still operating substantially in tension;

FIG. 21 illustrates the hook of FIG. 6 when engaged by a loop and loaded in shear;

FIG. 22 is a side elevation of a second embodiment of hook according to the present invention;

FIG. 23 is a diagrammatic representation of a hook material having many hooks of the present invention all facing in one direction to provide one way operation in shear and norm operation in tension; and

FIG. 24 shows a hook and loop assembly embodying the invention.

Referring now to FIG. 6, 7 or 8 the hook of the present invention is shown generally by reference numeral 20. Hook 20 has a rectangular cross-section (FIG. 7) with a thickness of about 0.012 inches and is integral at its base 22 with a planar base member 24 having a thickness of about 0.010 inches. As can be seen by examination of FIG. 6 the inner and outer faces of the hook at the base portion are steeply tapered towards each other with an angle of about 35°. This angle should be preferably at least 25°.

Hook 20 comprises a sturdy monolithic base 22 extending from planar base member 24 to a transition region 26 in which occurs a significant change of taper of the inner (front) face 21 with respect to the back face 44, with a transition to a generally arcuate resilient hook portion 28 with an inner face which arcs about center curvature 30 through an angle of about 160°. The outer face is essentially straight to the point F where transition to an arcuate surface occurs having a center of curvature 31 which is closer to the stem than is the center of curvature 30. The center of area of the base 22 and transition region 26 defines an axis 32 disposed at an angle 34 of about 17.5° to a line 36 normal to the planar base member. In various embodiments of the present invention this angle may be from about 15° to about 35° and preferably from about 17.5° to about 30° with about 17.5° being the best mode known to applicant at the present time. In the preferred form of tapered base shown, the front (21) to rear (44) thickness of the tapered base, as measured in FIG. 6 normal to the center of area axis is much (about 2 times) greater than the transverse thickness of the base of the point of attachment to the planar base member 24. This front (21) to rear (44) thickness rapidly decreases to the transition region where the front to rear thickness is about equal to, or slightly less than, the transverse thickness of the hook portion. This front to rear thickness then changes very slightly to the end of the hook.

It will be appreciated that the transition region is short relative to the height of the base and length of the hook portion and may be considered for the purposes of hook performance to have substantially zero length.

The base 22 in side elevation includes concave reinforcing fillets 38,40 providing a smooth transition with the base member 24 and buttressing support for the base.

Inner smoothly contoured generally concave face 42 is preferably textured at least in part as if sandblasted with 400 grit abrasive material, preferably an RMS of about 18 to 35, more preferably an RMS of about 20 to 30, to enhance frictional engagement of the hook 20 with a loop of a cooperating loop carrying member of a hook and loop fastener. Texturing to an RMS below about 18 RMS generally does not enhance frictional

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engagement significantly, while texturing to an RMS above about 35 generally is avoided since this increases loop wear and breakage upon disengagement.

The rectangular cross-section of the hook also aids the gripping of the hook by a loop as the loop bites into the corners of the rectangular cross section adjacent the textured surface.

Hook height H_t is 0.050 inches \pm 0.002 inches and the hook's width tapers smoothly and continuously to provide a thickness normal to center of area axis 32 and its curved extension axis defined by the center of area of the hook portion 28 indicated in FIG. 6 by reference characters A through L (ignoring Fillets 38,40) as follows:

TABLE I

LOCATION	DISTANCE ALONG CENTER OF AREA FROM BASE (INCHES)	WIDTH NORMAL TO CENTER OF AREA AXIS
B	0.005	about 0.0264
C	0.010	about 0.0190
D	0.015	about 0.0154
E	0.020	about 0.0122
F	0.025	about 0.0102
G	0.030	about 0.0098
H	0.035	about 0.0091
I	0.040	about 0.0082
J	0.045	about 0.0073
K	0.050	about 0.0065
L	0.055	about 0.0060

Table I is graphically presented as FIG. 9.

The degree of taper is important in design considerations and the following Table II presents the considerations and the following Table II presents the degree of taper in inches for each 0.005" step along the center of area axis, again ignoring fillets 38,40:

TABLE II

LOCATION OF STEP	MAGNITUDE OF TAPER
B-C	0.0074 in 0.005
C-D	0.0034 in 0.005
D-E	0.0034 in 0.005
E-F	0.0020 in 0.005
F-G	0.0004 in 0.005
G-H	0.0007 in 0.005
H-I	0.0009 in 0.005
I-J	0.0009 in 0.005
J-K	0.0008 in 0.005
K-L	0.0005 in 0.005

Table II is graphically presented as FIG. 10. Hook 6 also defines an at least partly convex, preferably smoothly contoured, outer face 44. As can be readily seen from FIG. 6, the portion of the inner face 42 adjacent the transition area is substantially straight and is inclined at an angle of about 5° oppositely to the inclination of the center of area axis 32 relative to the line 36 normal to the base member 24. Naturally this angle will vary with the degree of taper used and the inclination of the center area axis 32 and may be oppositely inclined as discussed below with reference to FIG. 22. In discussing the degree of taper in connection with the preferred embodiment of FIG. 6 it is noted that major portions of the front (21) and rear (44) surfaces of the base are largely straight lines. When these lines are curved the degree of taper can be estimated by using major chords extending from the planar base 24 to the transition point where the steep taper changes to the curved hook with slight taper.

One important aspect of the present invention is the provision of a smoothly and continuously tapered hook

shape which is shaped and dimensioned to be readily pulled from an open-ended but otherwise closed hook shaped cavity when partially solidified without unacceptable permanent hook deformation occurring. The above defined shape achieves this and FIGS. 11 through 16 illustrate this removal process step-by-step.

FIG. 11 shows a hook 20 filling a hook cavity 46 in the periphery 48 of a molding roller 50 with base member 24 in contact with the periphery 48. Once the hook (and base member) has cooled sufficiently to retain its shape without the aid of the cavity and to be sufficiently resilient to return to its desired shape after being pulled longitudinally from the mold while still being flexible enough to permit such removal without destructive

stresses being reached in the hook, the base member is pulled progressively away from the periphery of the molding roll and the hook is pulled progressively from the mold as shown sequentially in FIGS. 12 through 15 until it clears the cavity and springs back to its desired shape as shown in FIG. 16.

Review of FIGS. 12 through 15 will show how the choice of taper of the hook and the concave shape of the fillets coupled with the generally arcuate shape of the hook portion contribute to providing removal easing clearances facilitating the removal of the hook with minimal stressing of the hook material during that removal.

The texturing of the inner surface 2 of the hook may be achieved by corresponding texturing of the respective surface of the cavity.

FIGS. 17 through 21 show the hook 20 in use under various types and degrees of stress. In FIG. 17 the hook is under tension by a loop 52 applying a load to the resilient hook portion 28 normal to base member 24. Here the load is within the usual operating range encountered in use below that required to peel a hook and loop fastener apart. As can be seen at 54 compressive forces in the region of the outer surface 44 between location D-F (at about F) in the transition region 26 where the degree of taper sharply decreases from about 0.0034 in 0.005 inches (0-6 in 1) to less than 0.0010 in 0.005 (0.2 in 1) cause a deformation (minor buckling) of the outer surface. The buckling appears centered at about location F where the degree of taper drops below 0.0020 in 0.005 inches (2 in 5) and the width of the hook profile decreases to approximately equal the substantially constant thickness T (0.012 inches) of the hook 20. In this connection it should be noted that thickness T of the hook preferably exceeds the profile width in the area of loop engagement (i.e. between F and L) during tension operation in order to avoid undesired twisting or distortion normal to the profile shown in FIG. 6 which distortion inherently weakens the holding power

of the hook. This is not as important in shear operation due to the sturdy monolithic nature of base 22 below the transition region. However, the thickness must be sufficient to avoid twisting in shear. The 0.012 inch thick-

Table III following sets forth the advantageous performance of the hook of FIG. 6 by comparison with the standard hook of the prior art (as shown in FIGS. 1-5).

TABLE III

		Standard Hook (FIGS. 1-5) (0.070 hgt.) (Nylon 66)	FIG. 6 Hook (Elastomeric nylon)	FIG. 6 Hook (Stiff Nylon)	FIG. 6 Hook (Elastomeric polypropylene)
PEEL	(pounds/inch of width)	0.94 \pm .17 (1.02-1.21)	.97 \pm .37	2.80 \pm .31	.87 \pm .34
SHEAR	(pounds/sq. inch)	12.5 \pm 2.3	20.5 \pm 4.8	50.5 \pm 15.9	21.4 \pm 4.2
TENSION	(pounds/sq. inch)	7.0 \pm 3.0	11.7 \pm 1.4	22.8 \pm 9.1	11.6 \pm 3.6
STIFFNESS (dry)	(bending length (cm))	13.3 \pm 3	10.3 \pm 2	?	14.8 \pm .1
STIFFNESS (65% rh)	(bending length (cm))	10.6 \pm 2	10.6 \pm 3	12.7 \pm .1	15.3 \pm 2
TENSILE STRENGTH	(pounds/inch of width)	158 \pm 10	96 \pm 26	114 \pm 10	54 \pm 2
ELONGATION TO BREAK	(% of origi- nal length)	33 \pm 5	102 \pm 46	47% \pm 12	125% \pm 38
TEAR STRENGTH (md) ELMENDORF METHOD	(grams)	1472 \pm 87	227 \pm 18	317 \pm 26	163 \pm 10
TEAR STRENGTH (cd)	(grams)	does not tear	2240 \pm 363	1258 \pm 60	578 \pm 59
SEWN SEAM STRENGTH	(pounds/inch of seam)	thread break	thread break	thread break	14 \pm 2

ness of the hook of FIG. 6 has been found satisfactory in this respect. The inner concave face 42 is preferably so shaped as to bring a loop engaging hook 20 in shear to a position of engagement with the hook at about location E, so that the shear force is transmitted through the steeply tapered base below the location F of buckling under tension loading.

In FIG. 18 the tension force applied by the loop 52 is close to resiliently distorting the hook portion 28 sufficiently to release the loop as would happen as the hook and loop fastener parts are peeled apart. The buckling here is more pronounced and remains at about location F and the sturdy base remains substantially without deformation.

FIG. 19 shows a loop 52 engaging hook 20 and applying a load similar in magnitude to that applied in FIG. 17 but at an angle of about 30° to a direction normal to the base member. In this case a component of this load stresses the hook in shear. However, the primary load stresses hook 20 in tension as in FIG. 17. Again, a minor buckling is occurring at about location F.

FIG. 20 shows a highly stressed form of FIG. 19 just short of that needed to release the loop as a result of resilient distortion of the hook portion 28 under the applied load. As in FIG. 18 a substantial buckling is occurring at about location F.

FIG. 21 shows a highly stressed loading of hook 20, substantially only in shear, by loop 52. Because of the shape of the inner face 42 of the hook 20 the loop 52 engages the hook 20 at or below location E, and the pull of the loop it engages the hook for operation at or substantially in shear provides a force which intersects the hook in the region between the buckle point and the base member. As this transmission of force is through the sturdy monolithic (very strong) base of the hook below the location of buckling, great fastening strength is achieved in shear. In fact, this strength is so high that loop breakage can occur before the hook fails and the base member 24 can be seen to distort before significant hook distortion occurs.

FIG. 22 shows a variation of the hook of FIG. 6. In this case, the angle 34 of the center of area axis 24 is about 30° to the line 36 normal to the plane of base member 24 and the taper of the base and transition region of the hook is such that the inner face 42 is sloped in the same direction as axis 24 thereby to provide a positive component 56 of force urging a loop, engaging the hook in shear, toward the base member 24 to ensure maximum shear strength while retaining the peelable non-destruction loop and hook operation in tension. An inner face angle of at least about 10° to line 36 is appropriate and about -13° is preferred in the case of hooks made of Nylon and about 16° in the case of hooks made of polypropylene. An upper limit of about 20° may be necessary to meet other criteria of the design of the hook as set forth herein.

FIG. 23 shows a portion of base member 24 with a plurality of hooks 20 formed thereon. In this embodiment all hooks face in the same direction providing in shear engagement with loops, only in one direction. In the opposite direction the loops slide freely up the outer face 44 of the hooks and do not engage the hooks. This provides great strength in shear in one direction and ready separation on shear in the opposite direction. In this arrangement the operation of the hook and loop fastener in tension remains substantially normal. Of course, the hooks may have differing orientations to provide multi-directional shear operation coupled with normal tension operation.

FIG. 24 shows another preferred embodiment of the invention wherein a hook and loop fastener is shown having separate hook and loop assemblies. The hook assembly includes a number of hooks 20 extending from an integral planar base of the type generally described previously. As noted, these hooks are generally smoothly tapered from a sturdy base portion to a tip portion 28. A multiplicity of the books are aligned in a given direction so that adjacent hooks constitute a pair. The tip portion 28 of each hook extends in the given direction and faces a rear inclined surface 44 of the front

hook in its pair. The curved tip portion 23 and the inclined surface 44 define a wedge-shaped opening having at the top, as illustrated, a maximum width and having a minimum width at the closest point between the front of the tip portion 23 and the adjacent rear surface 44 of the front hook. The cooperating loop assembly comprises a planar base 43 carrying a plurality of hooks 50. In FIG. 24 the plurality of the loop assemblies are shown and the cooperation between the wedge-shaped opening and a plurality of loops carried by the loop assembly is illustrated. As the loop assembly is forced downwardly towards the hook assembly a group of loops is forced through the wedge-shaped opening defined between a pair of hook elements. In the left hand side of FIG. 24 the loop assembly is just approaching the wedge. The next loop assembly is just entering the maximum width of the wedge-shaped opening. In the next portion of FIG. 24 the loop assembly has passed through the minimum width of the wedge-shaped opening and the rear loops have been forced, by the front loop which is still in engagement with the inclined surface 44, to travel under the tip of the rear hook. In the last portion of FIG. 24 the support for the loop assembly has been moved away from the hook assembly and the last three loops are shown as being held by the tip portion 23 of the rear hook.

As will be appreciated, with this construction there is a forcible positioning of the loops as they are brought into contact with the hook element, which assures engagement of the hook by the loops. For example, if one examines FIG. 24 and imagines that the right hand hook of a pair is not present and the loop assembly is pushed downward in contact with the hook assembly it would, at most, provide engagement of one and possibly two loops. In this case there would be no lateral force tending to push even the second loop under the tip of the hook. In fact, the force would be away from the tip rather than towards it.

While in the specific embodiment shown in FIG. 24 a number of loops (5 in this case) are illustrated, greater or lesser numbers can be employed. For example, there may be certain situations where particularly strong loops are required. For example, in those situations where the hook and loop fastener constitutes a means for connecting structural elements together. In this case, perhaps only two loops might pass through minimum width of the wedge. But even in this case the inclined surface of the front hook will tend to force both hooks under the tip of the adjacent rear hook. And even if the front loop does not engage the hook, the back loop will be forced under the hook portion and will be positively engaged thereby.

As will be appreciated, the unique cooperative relationship between the front and back surfaces of the two hooks of a pair provide a novel structure of closely spaced hooks and provides a novel method of assuring engagement by the loop assembly of the hook and loop fastener.

The close relationship of the hooks and their smooth curved upper surface also have additional advantages. With the high density of hooks, which can be as high as 750 hooks per square inch compared with about 300 from prior art woven constructions, the hook assembly provides a surface which, while undulating feels smooth to the touch and does not have protruding sharp ends and is relatively incompressible compared to woven constructions. The type of construction illustrated in FIG. 24 gives greatly improved non-snagging charac-

teristics and greatly reduces lint pick-up in use during washing. It also has the characteristic of very low abrasion by the hooks against adjacent textile surfaces. With this type of hook assembly, the loops are readily and positively engaged, as described above, but other fibers are only poorly engaged by the hooks.

In FIG. 24 the tips of the hooks all extend in the same direction. This will provide, as mentioned previously, high shear when the loops are moved to the left as shown in FIG. 24. In order to get multidirectional shear operation an adjacent line of hooks can extend in the opposite direction. Thus one line of hooks will give high shear when the loops are pulled in one direction and the adjacent lines of hooks will give high shear strength when the loops are pulled in the opposite direction.

As will be noted from FIG. 24 the maximum width of the wedge is about twice the minimum width of the wedge. This relation is not critical. The important feature is that there be sufficient pressure on the front loop so that it forces all of the rear loops to move away from the front hook and towards and under the tip of the rear hook as the loops pass through the narrow portion of the wedge. The precise number of loops which are forced under the tip will depend upon the density of loops and the actual spacings involved. The important feature is that there be a high enough density of loops so that the front loop will exert a rearward force on the back loop or a group passing through the smallest portion of the wedge-shaped opening.

While the present invention has been described with particular reference to the individual molding of each hook on a common base member, it will be appreciated that the beneficial performance of the present invention can be achieved using other manufacturing methods including producing an extrusion including the hook profiles in its transverse cross-section, the hooks subsequently being formed by removing transverse hook-shaped portions of the extrusion as, for example, by machining.

We claim:

1. An improved hook for hook and loop fasteners having a profile defined by an inner generally concave face and an outer generally convex face, said hook comprising a planar base member intimately engaging a tapered base portion and extending therefrom to join, in a transition region, a tapered hook portion able to engage a loop applying a force to the hook portion substantially normal to the planar base member and terminating in a free end, the taper on the hook portion being much less than the taper on the base portion wherein the hook tapers continuously downwardly in width from the tapered base portion to the free end such that a loop engaging the hook in tension, with the said force being substantially normal to the planar base member, will cause a hinging or buckling of the hook at a location adjacent the outer face in the transition region as the hook deforms under the applied force and such that a loop engaging the hook in shear, with said force substantially parallel to the planar base member, will transmit bending force through the tapered base portion between the location of buckling and the planar base member, the hook being of substantially constant thickness and having a substantially rectangular transverse cross-section, said taper being from about 0.6 in 1 to about 0.2 in 1 in the transition region at about the buckling location.

2. An improved hook according to claim 1 wherein the hook has a width substantially equal to its thickness at about the location of buckling.

3. An improved hook according to claim 2 wherein the inner face in the transition region has an angle of at least about 10° to the direction normal to the base member oriented to encourage a loop engaging said hook in shear to move toward said base member.

4. An improved hook according to claim 3 wherein said inner face angle is at least about 13°.

5. An improved hook according to claim 4 made of Nylon wherein said inner face angle is about 13°.

6. An improved hook according to claim 4 made of Polypropylene wherein said inner face angle is about 16°.

7. An improved hook according to claim 1 wherein the hook defines a center of area axis angle in the base and transition region, at an angle of about 15° to about 35° to a direction normal to the base member whereby said axis slopes toward the hook portion as it extends away from the base member.

8. An improved hook according to claim 7 wherein said axis angle is from about 17.5° to about 30°.

9. An improved hook according to claim 8 wherein said axis angle is about 17.5°.

10. An improved hook according to claim 1 wherein hook thickness is about 0.012 inches, hook height is about 0.050 inches \pm 0.002 inches and the hook width tapers from about 0.025 inches adjacent the base member to about 0.006 inches adjacent the free end.

11. An improved hook according to claim 1 wherein the inner generally concave force is so shaped as to encourage a loop engaging the hook in shear to engage the hook at about the location of buckling.

12. An improved hook for hook and loop fasteners having a profile defined by an inner smoothly contoured generally concave face and an outer generally convex face, said hook comprising a sturdy base intimately engaging a substantially planar base portion member and extending therefrom with a relatively large taper to join a resilient hook portion, able to engage a loop applying a force to the hook portion substantially normal to the base member, terminating in a free end, wherein the hook tapers slightly, smoothly and continuously downwardly in width from the base member to the free end, the front to rear width of the hook portion where it the hook portion joins the base portion being about equal to its transverse thickness, whereby a loop engaging the hook in tension, with the applied force being substantially normal to the base member, will deform the hook portion resiliently under the applied force to release the loop at a desired applied force and such that a loop engaging the hook in shear, with the applied force substantially parallel to the base member, will engage the sturdy base member, the sturdy base member being sharply tapered and sufficiently sturdy that it will not deform to release a loop engaging the hook in a shear at or below the desired applied force, the effective taper of the base portion as measured between its inner and outer faces being at least 25°, said taper being from about 0.6 in 1 to about 0.2 in 1 at the transition from the sturdy base to the hook portion.

13. An improved hook according to claim 12 wherein the hook defines a center of area axis angled in the base, at an angle of about 15° to about 35° in a direction normal to the base member whereby said axis slopes toward the hook portion as the axis extends away from the base member.

14. An improved hook according to claim 13 wherein said the axis angle is from about 17.5° to about 30°.

15. An improved hook according to claim 14 wherein said the axis angle is about 17.5°.

16. An improved hook according to claim 12 wherein the inner face in the transition region has an angle of at least 10° to about 20° to a direction normal to the base member oriented to encourage a loop engaging said hook in shear to move toward said base member.

17. An improved hook according to claim 16 made of Nylon wherein said inner face angle is about 13°.

18. An improved hook according to claim 16 made of Polypropylene wherein said inner face angle is about 16°.

19. An improved hook according to claim 16 wherein said inner face angle is about 13°.

20. An improved hook according to claim 12 wherein said axis angle is at least about 30°.

21. An improved hook according to claim 12 wherein said taper is about 0.4 in 1 at transition between the point 6 to 1 taper to the 0.2 to 1 taper.

22. An improved hook according to claim 12 wherein hook thickness is about 0.012 inches, hook height is about 0.050 inches \pm 0.002 inches and the hook width tapers from about 0.026 inches adjacent the base member to about 0.006 inches adjacent the free end of the hooks.

23. An improved hook according to claim 12 wherein the sturdy base is sufficiently sturdy that the base member deforms before the sturdy base deforms under an applied load applied in shear to the sturdy base by a loop.

24. A hook and loop fastener comprising separate hook and loop assemblies, each hook assembly comprising a number of hooks according to claim 12 extending from an integral planar base, a multiplicity of said hooks being aligned in a given direction so that adjacent hooks constitute a pair, with a front hook and a rear hook in each pair, the tip portion of each hook extending in the given direction, each hook being inclined from the integral base in the given direction, the front hook in a pair having a rear source which is inclined in the given direction and forms a wedge-shaped opening with a front surface of the tip portion of the rear hook, said wedge-shaped opening having predetermined minimum and maximum widths as measured in said given direction, said loop assembly having a plurality of loops extending from a planar support thereof, there being a sufficient density of loops that more than two loops are present on a length of support measured in said given direction which is equal to said maximum width, said minimum width being large enough to permit at least two of said loops to pass therethrough simultaneously, whereby forcible movement of said loop assembly into engagement with said hook assembly will compress a group of loops together as they enter the wedge-shaped opening and all of the group of loops will be forced toward the rear hook as the loops pass through the minimum wedge width and the rear loop in the group will be forced by the front loop, which is still under pressure from the inclined rear surface of the front hook, to travel under the tip portion of the rear hook to be engaged thereby.

25. The hook and loop assembly of claim 24 wherein a number of rows of said hooks are provided and wherein different rows have hooks which are aligned in directions which are different from one row to another

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to provide high resistance to shear in more than one direction.

26. An improved hook assembly according to claim 24, wherein said hooks each have an inner generally concave face which is textured to exchange frictional engagement of the said hook with a cooperating loop.

27. An improved hook assembly comprising a plurality of rows of the hooks of claim 12, with all of the hook

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portions extending in the same direction, wherein said assembly has high shear resistance in one direction and low shear resistance in the opposite direction.

28. An improved hook according to claim 12, wherein said inner generally concave face is textured to enhance frictional engagement of the hook with a cooperating loop.

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<u>Number</u>	<u>Counts As</u>	<u>Depends From</u>	<u>Description</u>
1	-	-	Cancelled
2	-	-	Cancelled
3	-	-	Cancelled
4	-	-	Cancelled
5	-	-	Cancelled
6	-	-	Cancelled
7	-	-	Cancelled
8	-	-	Cancelled
9	1	-	
10	1	9	
11	1	9	
12	1	9	
13	1	9	
14	1	13	
15	1	13	
16	1	-	
17	1	-	
18	1	-	
19	1	-	
20	4	16,17,18,19	
21	4	16,17,18,19	
22	4	16,17,18,19	
23	4	16,17,18,19	
24	1	17	
25	1	17	
26	3	16,18,19	
27	3	16,18,19	
28	1	19	
29	1	19	

You have:
5 independent claims.
37 total claims.
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MISCELLANEOUS PTO CORRESPONDENCE CHECKLIST
(USE WHENEVER NO OTHER PTO CORRESPONDENCE CHECKLIST APPLIES)

Client/Matter Number: 05918/005003
Client/Matter Name : Velcro/reissue

June 13, 1997

1st 2nd
Check Check

☒ ☐ Title of PTO correspondence: Communication

☐ This PTO correspondence is being filed:

☐ in response to a PTO action or notice (please specify) _____

☒ to supplement our earlier reissue appl June 4, 1997; correction

☐ other (please specify) _____

☐ If applicable, the PTO action or other event that prompted this filing has been checked to confirm the due date was docketed correctly and is satisfied by this filing.

☐ If required, a Petition for Extension of Time and a check for the small/large entity fee is included. Check amount: _____

☐ This PTO correspondence identifies the mailing date of the PTO action or the reason for this filing, lists all items being submitted, and includes the standard charges/credits statement.

☐ If required by amendments to the claims, a check for the small/large entity fee for any net additional claims is included. Check amount: _____

☒ ☐ First class certificate of mailing is included, signed and dated.

☒ ☐ Postcard includes billing attorney's initials and lists all papers being sent and the number of pages of each.

☒ ☐ Preprinted envelope or label is used, which is addressed to Assistant Commissioner for Patents, Washington, DC 20231.

☐ File copies are complete, including all signatures and dates.

☒ ☐ Billing secretary's manual docket entry is updated.

☐ ~~Action Due Record in database is updated. File copy, tab, and updated table of contents are filed in prosecution folder.~~

Checked By: PAK

1st Checker

Handling Atty

2nd Checker & Date

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INSTRUCTIONS

This checklist is intended to minimize errors in the filing of PTO correspondence. It must be completed for all PTO correspondence that does not already require another, more specific, checklist.

- Step 1** **First Checker** (typically, the handling attorney/agent's secretary) reviews each item on the checklist, completes any information requested, and checks each box in the first column of boxes. Note: The first check is done BEFORE the attorney/agent signs anything. When the first check is complete, the first checker initials the checklist where indicated and presents the response and checklist to the attorney/agent.
- Step 2** **Handling Attorney** reviews the correspondence and the first column of boxes on the checklist for completeness and initials the checklist where indicated. Once the attorney has reviewed the checklist, he or she signs the PTO correspondence and related papers and returns them to the first checker who calls the second checker.
- Step 3** **Second Checker** reviews each item on the checklist, double checks any information entered by the first checker, and checks each box in the second column of boxes. Once the double check is done, the second checker initials the checklist where indicated, seals the envelope, and gives it to office services to deliver to the Post Office.

If at any point in the above steps the PTO correspondence does not comply with the requirements of the checklist, the correspondence and checklist are to be returned to the first checker with an explanation of what is wrong so that it can be corrected.

If the PTO correspondence is filed when a second checker is unavailable, the first checker should complete the first column of boxes, ensure that all necessary signatures and copies are made, and then file the correspondence, leaving the checklist and file with the second checker to be completed the next business day.

Please forward your questions regarding this form and its use to Practice Systems.

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PATENT
ATTORNEY DOCKET NO.: 05918/005003

The Patent and Trademark Office date stamp sets forth the date of receipt of:

Applicant or Patentee George A. Provost
No. (Application, Appeal, Interference, Patent, Reexam) Not yet assigned; reissue of
Filing or Issue Date June 4, 1997 USP 5,315,740
Title HOOK FOR HOOK AND LOOP FASTENER

<input type="checkbox"/> Transmittal Letter (2 copies)	<input type="checkbox"/> With Pet. for Ext.
<input type="checkbox"/> Assignment	<input type="checkbox"/> Status Inquiry
<input type="checkbox"/> Amendment/Response <u> </u> Pages	<input type="checkbox"/> Declaration
<input type="checkbox"/> Maintenance Fee	<input type="checkbox"/> Request Certificate of Correction
<input type="checkbox"/> Check \$ <u> </u>	<input type="checkbox"/> Notice of Appeal
<input type="checkbox"/> Deposit Account Order Form (2 copies)	<input type="checkbox"/> Appeal Brief (3 copies) <u> </u> Pages
<input type="checkbox"/> Issue Fee <input type="checkbox"/> Request Patent Copies	<input type="checkbox"/> Petition for Extension of Time
<input type="checkbox"/> Information Disclosure Statement	
<input type="checkbox"/> PTO 1449 Form - <u> </u> Pages	
<input type="checkbox"/> Prior Art References - Number of References <u> </u>	
<input type="checkbox"/> Drawings <u> </u> Sheets Formal <u> </u> Sheets Informal <u> </u> Sheets Amended	
<input type="checkbox"/> Notice of Missing Parts	
<input type="checkbox"/> Combined Declaration and Power of Attorney	
<input type="checkbox"/> Small Entity Statement	
<input checked="" type="checkbox"/> Other <u>Communication (2pp.)</u>	
	<u>Proposed IDS (2pp.)</u>
	<u>PTO-1449 Form (7pp.)</u>

(pat)
Atty/Sec WEB/jjv Client/ Velcro/Reissue Date 6/13/97
Initials Matter Name

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Serial No.: Not Yet Assigned
Filed : June 4, 1997
Title : HOOK FOR HOOK AND LOOP FASTENER

Application for Reissue of Patent No. 5,315,740
Issued : May 31, 1994

Assistant Commissioner for Patents
Washington, DC 20231

COMMUNICATION

This communication is being filed prior to Applicant's receipt of a serial number for the above-captioned reissue application.

On May 4, 1997, Applicant filed, *inter alia*, a combined petition for reissue of Patent No. 5,315,740 and reissue declaration. The declaration stated that an Information Disclosure Statement (IDS) would be filed with the application for reissue. Due to an oversight, the IDS was not filed with the reissue application.

Applicant desires to remedy the oversight as quickly as possible by filing the IDS immediately. However, it is understood that the Office generally prefers that an applicant refrain from filing additional papers in an application until a serial number is assigned to the application.

Therefore, Applicant is only submitting a "Proposed Information Disclosure Statement" and a Form 1449 with this


Date of Deposit June 13, 1997
I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

William E. Borth

Communication. These papers are intended to provide notice of the art that Applicant intends to file with an IDS after receiving a serial number for the subject application.

Respectfully submitted,

Date: June 13, 1997


Jonathan J. Wainer
Reg. No. 36,712

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Telephone: 617/542-5070
Facsimile: 617/542-8906
248682.B11

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Serial No.: Not Yet Assigned
Filed : June 4, 1997
Title : HOOK FOR HOOK AND LOOP FASTENER

Application for Reissue of Patent No. 5,315,740
Issued : May 31, 1994

Assistant Commissioner for Patents
Washington, DC 20231

PROPOSED INFORMATION DISCLOSURE STATEMENT

Applicant submits the references listed on the attached form PTO 1449.

Applicant also discloses the following information. In Interference No. 103,718, the opposing party has asserted invalidity of Provost claims 1-15 on the basis of Thomas EP 0 381 087, Provost U.S. Patent No. 4,984,339, and sales of hooks described in the specification of the '740 patent in a motion under Rule 1.633(a); copies of the motion, opposition, and reply are submitted herewith. In addition, prior art sales of textile and molded hook products are described in the Declarations of George A. Provost (First and Second), Sari Ann Strasburg (First and Second), Wil DeHollander, and Deborah S. Covatis, copies of which are enclosed herewith.

Duplicate

Date of Deposit _____

I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

This statement is being filed within three months of the filing date of the application. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: _____

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Facsimile: 617/542-8906
248682.B11

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO.	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				APPLICANT George A. Provost			
				FILING DATE		GROUP	

(37 CFR 1.801) JUN 18 2001

U.S. PATENT DOCUMENTS													
EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE							
AA	5 5 6 9 2 3 3	10/29/96	Goulait	604	391	12/20/94							
AB	5 5 4 0 6 7 3	7/30/96	Thomas et al.	604	391	1/31/95							
AC	5 4 7 0 4 1 7	11/28/95	Goulait	156	201	10/11/94							
AD	5 4 0 7 4 3 9	4/18/95	Goulait	604	391	6/1/94							
AE	5 3 9 2 4 9 8	2/28/95	Goulait et al.	24	452	12/10/92							
AF	5 3 8 5 7 0 6	1/31/95	Thomas	264	519	4/7/93							
AG	5 3 8 0 3 1 3	1/10/95	Goulait et al.	604	391	1/16/92							
AH	5 3 2 6 6 1 2	7/5/94	Goulait	428	100	5/20/91							
AI	5 3 2 6 4 1 5	7/5/94	Thomas et al.	156	244	9/3/93							
AJ	5 3 2 5 5 6 9	7/5/94	Goulait et al.	24	448	10/30/92							
AK	5 3 1 8 7 4 1	6/7/94	Thomas	264	519	6/17/93							
AL	5 2 3 1 7 3 8	8/3/93	Higashinaka	24	446	12/12/91							
AM	5 2 3 0 8 5 1	7/27/93	Thomas	264	145	3/7/91							
AN	5 2 2 1 2 7 6	6/22/93	Battrell	604	389	2/24/92							
AO	5 1 8 0 5 3 4	1/19/93	Thomas et al.	264	145	12/21/90							

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION							
DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION		
					YES	NO	
AP	WO 94/23610	10/27/94	PCT				
AQ	A1 0 381 087	8/8/90	EPO				
AR	A2 0 276 970	8/3/88	EPO				
AS	WO87/06522	11/87	PCT				
AT	2929329	2/5/81	Fed. Rep. of Germany				
AU	TW 34231	12/1/80	Taiwan				
AV	TW 48288	1/1/83	Taiwan				

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)			
AW			

EXAMINER	DATE CONSIDERED
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EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

SUBSTITUTE FORM PTO-1449
(MODIFIED)U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTY. DOCKET NO.
05918/005003

SERIAL NO.

INFORMATION DISCLOSURE
STATEMENT BY APPLICANT

(Include several sheets if necessary)

(37 CFR 1.98(b))

APPLICANT
George A. Provost

FILING DATE

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIALS	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1 5 8 8 1 9	10/27/92	Goodman, Jr. et al.	428	131	6/29/90
BB	5 1 1 9 6 4 3	6/9/92	Conley et al.	66	190	12/21/90
BC	5 1 1 6 5 6 3	5/26/92	Thomas et al.	264	167	6/28/90
BD	5 0 6 7 2 1 0	11/26/91	Kayaki	24	452	10/3/90
BE	5 0 5 8 2 4 7	10/22/91	Thomas et al.	24	448	5/1/90
BF	5 0 3 2 1 2 2	7/16/91	Noel et al.	604	391	5/17/89
BG	4 9 9 9 0 6 7	3/12/91	Erb et al.	156	73.1	2/13/89
BH	4 9 8 4 3 3 9	1/15/91	Provost et al.	24	452	10/20/88
BI	4 9 7 3 3 2 6	11/27/90	Wood et al.	604	391	11/30/87
BJ	4 9 6 3 1 4 0	10/16/90	Robertson et al.	604	389	12/17/87
BK	4 9 5 9 2 6 5	9/25/90	Wood et al.	428	343	4/17/89
BL	4 9 3 6 8 4 0	6/26/90	Proxmire	604	385.2	12/31/87
BM	4 9 1 9 7 3 8	4/24/90	Ball et al.	156	73.5	5/25/89
BN	4 8 9 4 0 6 0	1/16/90	Nestegard	604	391	1/11/88
BO	4 8 8 3 7 0 7	11/28/89	Newkirk	428	219	4/21/88
BP	4 8 6 1 3 9 9	8/29/89	Rajala et al.	156	66	11/4/87
BQ	4 8 5 4 9 8 4	8/8/89	Ball et al.	156	73.5	6/19/87
BR	4 8 4 6 8 1 5	7/11/89	Scripps	604	391	12/18/87
BS	4 8 3 4 7 3 8	5/30/89	Kielpikowski et al.	604	385.2	7/14/88
BT	4 7 9 4 0 2 8	12/27/88	Fischer	428	100	5/15/86
BU	4 7 6 1 3 2 2	8/2/88	Raley	428	156	10/7/85

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	BV	55-137942	10/28/80	Japan			X (abs only)	
	BW	54-28369	3/2/79	Japan				
	BX	51-14535	5/10/76	Japan				
	BY	JP 02-88015	3/28/90	Japan				X
	BZ	GB 2 233 876 A	1/23/91	GB				

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U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICEATTY. DOCKET NO.
05918/005003

SERIAL NO.

INFORMATION DISCLOSURE
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APPLICANT
George A. Provost

FILING DATE

GROUP

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	CA	4	7	6	1	3	1	8	8/2/88	Ott et al.	428	89	8/29/86
	CB	4	7	3	9	6	3	5	4/26/88	Conley et al.	66	190	7/8/87
	CC	4	7	3	7	4	0	4	4/12/88	Jackson	428	284	8/16/84
	CD	4	7	2	5	4	7	3	2/16/88	Van Gompel et al.	428	156	11/25/86
	CE	4	7	2	5	2	2	1	2/16/88	Blanz	425	575	5/23/86
	CF	4	7	0	7	8	9	3	11/24/87	Hashizume et al.	24	446	5/2/86
	CG	4	6	9	9	6	2	2	10/13/87	Toussant et al.	604	389	3/21/86
	CH	4	6	9	5	5	0	0	9/22/87	Dyer et al.	428	134	7/10/86
	CI	4	6	7	2	8	9	3	6/16/87	Mammarella, Sr.	101	170	3/21/85
	CJ	4	6	5	4	2	4	6	3/31/87	Provost et al.	428	88	9/5/85
	CK	4	6	1	5	0	8	4	10/7/86	Erb	24	442	8/21/84
	CL	4	6	0	0	6	1	8	7/15/86	Raychok, Jr. et al.	428	92	3/16/84
	CM	4	5	9	6	5	6	8	6/24/86	Flug	604	369	10/22/84
	CN	4	5	8	7	1	5	2	5/6/86	Gleichenhagen et al.	428	195	12/11/84
	CO	4	5	7	3	9	9	1	3/4/86	Pieniak et al.	604	385	7/23/84
	CP	4	5	6	2	0	9	9	12/31/85	Hinchcliffe	427	282	1/18/84
	CQ	4	5	3	2	1	5	7	7/30/85	Schmidt et al.	427	262	12/27/82
	CR	4	4	6	3	4	8	6	8/7/84	Matsuda	28	161	8/12/81
	CS	4	4	5	4	1	8	3	6/12/84	Wollman	428	100	10/20/83

FOREIGN PARENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	CT	FR 176745	1/4/69	FR				
	CU	GB 1 140 576	1/22/69	GB				
	CV	FR 2 586 558	3/6/87	FR			X	
	CW	DE 3533541-A	4/3/86	DE				
	CX	0 187 725 B1	3/27/91	EPO				

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PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Serial Number: 08/868,762
Filed: June 4, 1997
Title : HOOK FOR HOOK AND LOOP FASTENERS

Application for Reissue of U.S. Patent No. 5,315,740
Issued : May 31, 1994

Assistant Commissioner for Patents
Washington, DC 20231

INFORMATION DISCLOSURE STATEMENT

Applicant submits the references listed on the attached
form-PTO-1449, copies of which are enclosed.

Submitted herewith is an English translation of the
following foreign language references, or portions thereof:

55-137942	Japan;
54-28369	Japan;
51-14535	Japan;
2 586 558	France;
2 432 108	France;
3533881	Federal Republic of Germany.

Applicant had filed a Communication on June 13, 1997,
prior to receiving the official filing receipt, with a "Proposed
Information Disclosure Statement" and form 1449. The form 1449
submitted with this Information Disclosure Statement differs from
the earlier submitted form 1449 in at least two respects. First,
the citations to FR 176745 and FR 1299897 on the earlier Form
1449 have been corrected to the single citation to GB 1299897.

Date of Deposit October 30, 1997
I hereby certify under 37 CFR 1.8(a) that this correspondence is being
deposited with the United States Postal Service as first class mail
with sufficient postage on the date indicated above and is addressed to
the Assistant Commissioner for Patents, Washington, D.C. 20231.

[Signature]
KENNETH R. MABEN

Duplicate

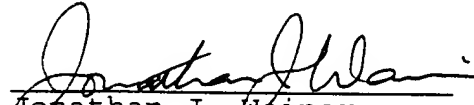
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Second, a double entry of EP 0 381 087 on the earlier form 1449
has been corrected.

This statement is being filed before the receipt of a
first Office action on the merits. Please apply any charges or
credits to Deposit Account 06-1050.

Respectfully submitted,

Date: October 30, 1997


Jonathan J. Wainer
Reg. No. 36,712

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110-2804

Telephone: 617/542-5070
Facsimile: 617/542-8906

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SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762	
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) <div style="position: absolute; top: 100px; left: 50px; border: 1px solid black; border-radius: 50%; padding: 5px; text-align: center;"> OIPE JUN 18 2001 PATENT & TRADEMARK OFFICE </div>				APPLICANT George A. Provost		FILING DATE June 4, 1997	
				GROUP			
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL		PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
		5 5 6 9 2 3 3	10/29/96	Goulait	604	391	12/20/94
	AB	5 5 4 0 6 7 3	7/30/96	Thomas et al.	604	391	1/31/95
	AC	5 4 7 0 4 1 7	11/28/95	Goulait	156	201	10/11/94
	AD	5 4 0 7 4 3 9	4/18/95	Goulait	604	391	6/1/94
	AE	5 3 9 2 4 9 8	2/28/95	Goulait et al.	24	452	12/10/92
	AF	5 3 8 5 7 0 6	1/31/95	Thomas	264	519	4/7/93
	AG	5 3 8 0 3 1 3	1/10/95	Goulait et al.	604	391	1/16/92
	AH	5 3 2 6 6 1 2	7/5/94	Goulait	428	100	5/20/91
	AI	5 3 2 6 4 1 5	7/5/94	Thomas et al.	156	244	9/3/93
	AJ	5 3 2 5 5 6 9	7/5/94	Goulait et al.	24	448	10/30/92
	AK	5 3 1 8 7 4 1	6/7/94	Thomas	264	519	6/17/93
	AL	5 2 3 1 7 3 8	8/3/93	Higashinaka	24	446	12/12/91
	AM	5 2 3 0 8 5 1	7/27/93	Thomas	264	145	3/7/91
	AN	5 2 2 1 2 7 6	6/22/93	Battrell	604	389	2/24/92
	AO	5 1 8 0 5 3 4	1/19/93	Thomas et al.	264	145	12/21/90
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION							
		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION YES NO
	AP	WO 94/23610	10/27/94	PCT			
	AQ	A1 0 381 087	8/8/90	EPO			
	AR	A2 0 276 970	8/3/88	EPO			
	AS	WO87/06522	11/87	PCT			
	AT	2929329	2/5/81	Fed. Rep. of Germany			X
	AU	TW 34231	12/1/80	Taiwan			X
	AV	TW 48288	1/1/83	Taiwan			X
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)							
	AW						
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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1 5 8 8 1 9	10/27/92	Goodman, Jr. et al.	428	131	6/29/90
BB	5 1 1 9 6 4 3	6/9/92	Conley et al.	66	190	12/21/90
BC	5 1 1 6 5 6 3	5/26/92	Thomas et al.	264	167	6/28/90
BD	5 0 6 7 2 1 0	11/26/91	Kayaki	24	452	10/3/90
BE	5 0 5 8 2 4 7	10/22/91	Thomas et al.	24	448	5/1/90
BF	5 0 3 2 1 2 2	7/16/91	Noel et al.	604	391	5/17/89
BG	4 9 9 9 0 6 7	3/12/91	Erb et al.	156	73.1	2/13/89
BH	4 9 8 4 3 3 9	1/15/91	Provost et al.	24	452	10/20/88
BI	4 9 7 3 3 2 6	11/27/90	Wood et al.	604	391	11/30/87
BJ	4 9 6 3 1 4 0	10/16/90	Robertson et al.	604	389	12/17/87
BK	4 9 5 9 2 6 5	9/25/90	Wood et al.	428	343	4/17/89
BL	4 9 3 6 8 4 0	6/26/90	Proxmire	604	385.2	12/31/87
BM	4 9 1 9 7 3 8	4/24/90	Ball et al.	156	73.5	5/25/89
BN	4 8 9 4 0 6 0	1/16/90	Nestegard	604	391	1/11/88
BO	4 8 8 3 7 0 7	11/28/89	Newkirk	428	219	4/21/88
BP	4 8 6 1 3 9 9	8/29/89	Rajala et al.	156	66	11/4/87
BQ	4 8 5 4 9 8 4	8/8/89	Ball et al.	156	73.5	6/19/87
BR	4 8 4 6 8 1 5	7/11/89	Scripps	604	391	12/18/87
BS	4 8 3 4 7 3 8	5/30/89	Kielpikowski et al.	604	385.2	7/14/88
BT	4 7 9 4 0 2 8	12/27/88	Fischer	428	100	5/15/86
BU	4 7 6 1 3 2 2	8/2/88	Raley	428	156	10/7/85

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
BV	55-137942	10/28/80	Japan			X (abs only)	
BW	54-28369	3/2/79	Japan			X (abs only)	
BX	51-14535	5/10/76	Japan			X (abs only)	
BY	JP 02-88015	3/28/90	Japan				X
BZ	GB 2 233 876 A	1/23/91	GB				

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	7 6 1 3 1 8	8/2/88	Ott et al.	428	89	8/29/86
CB	4 7 3 9 6 3 5	4/26/88	Conley et al.	66	190	7/8/87
CC	4 7 3 7 4 0 4	4/12/88	Jackson	428	284	8/16/84
CD	4 7 2 5 4 7 3	2/16/88	Van Gompel et al.	428	156	11/25/86
CE	4 7 2 5 2 2 1	2/16/88	Blanz	425	575	5/23/86
CF	4 7 0 7 8 9 3	11/24/87	Hashizume et al.	24	446	5/2/86
CG	4 6 9 9 6 2 2	10/13/87	Toussant et al.	604	389	3/21/86
CH	4 6 9 5 5 0 0	9/22/87	Dyer et al.	428	134	7/10/86
CI	4 6 7 2 8 9 3	6/16/87	Mammarella, Sr.	101	170	3/21/85
CJ	4 6 5 4 2 4 6	3/31/87	Provost et al.	428	88	9/5/85
CK	4 6 1 5 0 8 4	10/7/86	Erb	24	442	8/21/84
CL	4 6 0 0 6 1 8	7/15/86	Raychok, Jr. et al.	428	92	3/16/84
CM	4 5 9 6 5 6 8	6/24/86	Flug	604	369	10/22/84
CN	4 5 8 7 1 5 2	5/6/86	Gleichenhagen et al.	428	195	12/11/84
CO	4 5 7 3 9 9 1	3/4/86	Pieniak et al.	604	385	7/23/84
CP	4 5 6 2 0 9 9	12/31/85	Hinchcliffe	427	282	1/18/84
CQ	4 5 3 2 1 5 7	7/30/85	Schmidt et al.	427	262	12/27/82
CR	4 4 6 3 4 8 6	8/7/84	Matsuda	28	161	8/12/81
CS	4 4 5 4 1 8 3	6/12/84	Wollman	428	100	10/20/83

FOREIGN PARENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
CT	GB 1 140 576	1/22/69	GB				
CU	FR 2 586 558	3/6/87	FR			X (abs only)	
CV	FR 2 586 558	3/6/87	FR			X	
CW	DE 3533541-A	4/3/86	DE				X
CX	0 187 725 B1	3/27/91	EPO				

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
DA	4 3 7 9 1 9 2	9/6/83	Redfern	604	391	10/21/80
DB	4 3 7 9 1 9 2	4/5/83	Wahlquist et al.	428	156	6/23/82
DC	4 3 7 4 8 8 8	2/22/83	Bornslaeger	429	198	9/25/81
DD	4 3 5 5 0 6 6	10/19/82	Newman	428	198	12/8/80
DE	4 3 3 0 9 0 7	5/25/82	Ochiai	24	204	3/31/80
DF	4 3 0 7 4 9 3	12/29/81	Ochiai	24	204	3/31/80
DG	4 2 9 0 8 3 2	9/22/81	Kalleberg	156	72	9/2/77
DH	4 2 9 0 1 9 4	9/22/81	Takahashi	29	766	11/1/79
DI	4 2 9 0 1 7 4	9/22/81	Kalleberg	24	204	1/13/78
DJ	4 2 1 6 2 5 7	8/5/80	Schams et al.	428	93	4/20/79
DK	4 1 6 9 3 0 3	10/2/79	Lemelson	24	204	11/24/76
DL	4 1 6 2 3 4 4	7/24/79	Rones	428	212	7/27/78
DM	4 0 8 2 8 8 6	4/4/78	Butterworth et al.	428	284	9/15/77
DN	4 0 6 7 6 0 9	1/10/78	Ness	297	220	11/22/76
DO	4 0 5 6 5 9 3	1/1/77	de Navas Albareda	264	145	6/21/74
DP	4 0 2 4 0 0 3	5/17/77	Bühler	156	148	5/27/75
DQ	3 9 7 1 3 8 1	7/27/76	Gibson	128	296	2/19/75

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

	DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
DR	0 324 577 A1	7/19/89	EPO				
DS	0 289 198 A1	11/2/88	EPO				
DT	0 325 473 A1	7/26/89	EPO				
DU	0 341 993 A1	11/15/89	EPO				

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

DV							
DW							

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Substitute Disclosure Form (PTO-1449)

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INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				APPLICANT George A. Provost			
				FILING DATE June 4, 1997		GROUP	
U.S. PATENT DOCUMENTS							
EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
	9 1 2 8	4/6/76	Ostermeier	428	152	8/22/72	
EB	3 9 4 3 9 8 1	3/16/76	De Brabander	139	391	3/25/74	
EC	3 9 1 3 1 8 3	10/21/75	Brumlik	24	204	6/28/73	
ED	3 9 0 5 0 7 1	9/16/75	Brumlik	24	204	8/13/73	
EE	3 8 9 5 7 9 7	7/22/75	Moore	273	32 A	7/17/74	
EF	3 8 6 7 9 4 0	2/25/75	Mesek et al.	128	287	8/6/73	
EG	3 8 6 7 9 3 5	2/25/75	Elsdorfer et al.	128	156	5/14/73	
EH	3 8 6 3 3 0 4	2/4/75	Brumlik	24	204	8/8/73	
EI	3 7 7 0 3 5 9	11/6/73	Hamano	425	305	9/25/72	
EJ	3 7 6 8 4 7 9	10/30/73	Widlund	128	287	2/8/71	
EK	3 7 6 2 0 0 0	10/2/73	Menzin et al.	24	204	11/11/71	
EL	3 7 0 8 8 3 7	1/9/73	Chiba	24	204	5/13/70	
EM	3 7 0 8 8 3 3	1/9/73	Ribich et al.	24	204	3/15/71	
EN	3 7 0 8 8 3 2	1/2/73	G.H. Erb	161	48	7/15/69	
EO	3 6 9 4 8 6 7	10/3/72	Stumpf	24	204	8/5/70	
EP	3 6 8 3 9 2 1	8/15/72	Brooks et al.	128	296	8/17/70	
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION							
	DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
EQ	0 388 681 A2	9/26/90	EPO				
ER	0 353 972 A1	2/7/90	EPO				
ES	0 409 315 A1	1/23/91	EPO				
ET	2 432 108	3/28/80	FR			X (abs only)	
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)							
	EU						
	EV						
EXAMINER				DATE CONSIDERED			
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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	8 9 3 3	7/25/72	Moore et al.	128	296	7/17/70
FB	3 6 6 5 9 2 2	5/30/72	Skora	128	290	11/20/69
FC	3 6 6 5 9 2 1	5/30/72	Stumpf	128	287	11/19/69
FD	3 5 9 4 8 6 5	7/27/71	George H. Erb	18	5	7/10/69
FE	3 5 9 4 8 6 3	7/27/71	George H. Erb	18	5	7/10/69
FF	3 5 6 2 0 4 4	2/9/71	G.H. Erb	156	155	3/12/68
FG	3 5 5 7 4 0 7	1/26/71	J.H. Lemelson	18	10	8/19/68
FH	3 5 5 0 8 3 7	12/29/70	George H. Erb	229	45	4/14/69
FI	3 5 5 0 2 2 3	12/29/70	G.H. Erb	24	204	12/22/67
FJ	3 5 4 6 7 5 4	12/15/70	G.H. Erb	24	204	8/12/68
FK	3 5 3 6 5 1 8	10/27/70	Arthur Herbert Drelich	117	38	3/10/67
FL	3 5 2 2 6 3 7	8/4/70	G.C. Brumlik	24	204	3/6/68
FM	3 4 9 4 0 0 6	2/10/70	G.C. Brumlik	24	204	1/12/68
FN	3 4 9 0 1 0 7	1/20/70	George C. Brumlik	24	204	12/16/67
FO	3 4 8 4 3 3 0	12/16/69	Robert C. Sokolowski et al.	161	59	4/28/66
FP	3 4 6 9 2 8 9	9/30/69	Horace E. Whitacre	24	205.17	2/6/69
FQ	3 4 6 1 5 1 3	8/19/69	L.H. Girard et al.	24	204	2/20/67
FR	3 4 0 5 4 3 0	10/15/68	Abraham Sidelman	24	204	7/29/66
FS	3 3 2 7 7 0 8	6/27/67	R.C. Sokolowski	128	156	6/27/67

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	FT	3533881	4/3/86	DE			X (abs only)	
	FU	1299 897	12/13/72	GB				

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

	FV		
	FW		

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U.S. PATENT DOCUMENTS

EXAMINER INITIALS	PATENT NUMBER	ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	1 9 3 0 7	5/16/67	I. Marforio	24	204	10/12/64
GB	3 3 1 2 5 8 3	4/4/67	James J. Rochlis	161	62	10/2/63
GC	3 3 0 2 2 3 2	2/7/67	T.J. Wasiloff et al.	15	230.17	7/6/64
GD	3 2 7 7 5 4 7	10/11/66	J. Billarant	24	204	12/17/62
GE	3 2 6 6 8 4 1	8/16/66	G. Altman	297	220	7/7/65
GF	3 2 6 6 1 1 3	8/16/66	W.C. Flanagan, Jr.	24	204	12/14/64
GG	3 2 5 5 7 4 9	6/14/66	J.A. Smithers	128	169	6/27/63
GH	3 2 2 6 7 5 1	1/4/66	J.H. Lemelson	15	118	2/8/63
GI	3 2 1 4 3 2 3	10/26/65	Gordon D. Russell et al.	161	148	2/11/64
GJ	3 1 7 6 3 6 4	4/6/65	A. Dritz	24	213	10/6/59
GK	3 1 7 1 8 2 0	3/2/65	R.A. Volz	260	2.5	2/17/64
GL	3 1 5 4 8 3 7	11/3/64	G. De Mestral	28	72	3/21/61
GM	3 1 4 7 5 2 8	9/8/64	G.H. Erb	24	204	11/14/61
GN	3 1 3 8 8 4 1	6/30/64	J. Naimer	24	204	10/23/62
GO	3 0 9 4 3 3 0	6/18/63	G.I. Smith	273	54	3/3/61
GP	3 0 8 5 3 0 9	4/16/63	Arthur R. Olson	28	79	3/9/60
GQ	3 0 8 3 7 3 7	4/2/63	G. De Mestral	139	16	5/9/58
GR	3 0 8 0 6 8 8	3/12/63	A. Politzer	51	185	6/26/62
GS	3 0 3 1 7 3 0	5/1/62	Louis H. Morin	24	204	9/26/58
GT	3 0 0 9 2 3 5	11/21/61	G. De Mestral	28	78	5/9/58
GU	3 0 0 5 2 1 9	10/24/61	C.S. Miller	15	98	5/26/59
GV	2 9 9 1 8 4 3	7/11/61	V.G. Bell, Jr.	183	51	12/30/58
GW	2 7 1 7 4 3 7	9/13/55	G De Mestral	28	72	10/15/52
GX	2 6 2 5 1 6 1	1/13/53	Robert W. Johnson	128	290	7/12/52
GY	2 4 9 6 8 2 0	2/7/50	C.A. Smith	155	184	12/24/46
GZ	2 0 3 9 3 1 2	5/5/36	J.H. Goldman	154	46	3/15/35

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	DA	4	4	0	2	6	9	0	9/6/83	Redfern	604	391	10/21/80
	DB	4	3	7	9	1	9	2	4/5/83	Wahlquist et al.	428	156	6/23/82
	DC	4	3	7	4	8	8	8	2/22/83	Bornslaeger	429	198	9/25/81
	DD	4	3	5	5	0	6	6	10/19/82	Newman	428	198	12/8/80
	DE	4	3	3	0	9	0	7	5/25/82	Ochiai	24	204	3/31/80
	DF	4	3	0	7	4	9	3	12/29/81	Ochiai	24	204	3/31/80
	DG	4	2	9	0	8	3	2	9/22/81	Kalleberg	156	72	9/2/77
	DH	4	2	9	0	1	9	4	9/22/81	Takahashi	29	766	11/1/79
	DI	4	2	9	0	1	7	4	9/22/81	Kalleberg	24	204	1/13/78
	DJ	4	2	1	6	2	5	7	8/5/80	Schams et al.	428	93	4/20/79
	DK	4	1	6	9	3	0	3	10/2/79	Lemelson	24	204	11/24/76
	DL	4	1	6	2	3	4	4	7/24/79	Rones	428	212	7/27/78
	DM	4	0	8	2	8	8	6	4/4/78	Butterworth et al.	428	284	9/15/77
	DN	4	0	6	7	6	0	9	1/10/78	Ness	297	220	11/22/76
	DO	4	0	5	6	5	9	3	1/1/77	de Navas Albareda	264	145	6/21/74
	DP	4	0	2	4	0	0	3	5/17/77	Bühler	156	148	5/27/75
	DQ	4	9	7	1	3	8	1	7/27/76	Gibson	128	296	2/19/75

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	DR	0 324 577 A1	7/19/89	EPO				
	DS	0 289 198 A1	11/2/88	EPO				
	DT	0 325 473 A1	7/26/89	EPO				
	DU	0 341 993 A1	11/15/89	EPO				

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

	DV		
	DW		

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(37 CFR 1.98(b))

U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	EA	3	9	4	9	1	2	8	4/6/76	Ostermeier	428	152	8/22/72
	EB	3	9	4	3	9	8	1	3/16/76	De Brabander	139	391	3/25/74
	EC	3	9	1	3	1	8	3	10/21/75	Brumlik	24	204	6/28/73
	ED	3	9	0	5	0	7	1	9/16/75	Brumlik	24	204	8/13/73
	EE	3	8	9	5	7	9	7	7/22/75	Moore	273	32 A	7/17/74
	EF	3	8	6	7	9	4	0	2/25/75	Mesek et al.	128	287	8/6/73
	EG	3	8	6	7	9	3	5	2/25/75	Elsdorfer et al.	128	156	5/14/73
	EH	3	8	6	3	3	0	4	2/4/75	Brumlik	24	204	8/8/73
	EI	3	7	7	0	3	5	9	11/6/73	Hamano	425	305	9/25/72
	EJ	3	7	6	8	4	7	9	10/30/73	Widlund	128	287	2/8/71
	EK	3	7	6	2	0	0	0	10/2/73	Menzin et al.	24	204	11/11/71
	EL	3	7	0	8	8	3	7	1/9/73	Chiba	24	204	5/13/70
	EM	3	7	0	8	8	3	3	1/9/73	Ribich et al.	24	204	3/15/71
	EN	3	7	0	8	8	3	2	1/2/73	G.H. Erb	161	48	7/15/69
	EO	3	6	9	4	8	6	7	10/3/72	Stumpf	24	204	8/5/70
	EP	3	6	8	3	9	2	1	8/15/72	Brooks et al.	128	296	8/17/70

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	EQ	0 381 087 A1	8/8/90	EPO				
	ER	0 388 681 A2	9/26/90	EPO				
	ES	0 353 972 A1	2/7/90	EPO				
	ET	0 409 315 A1	1/23/91	EPO				
	EU	2 432 108	3/28/80	FR				

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	FA	3	6	7	8	9	3	3	7/25/72	Moore et al.	128	296	7/17/70
	FB	3	6	6	5	9	2	2	5/30/72	Skora	128	290	11/20/69
	FC	3	6	6	5	9	2	1	5/30/72	Stumpf	128	287	11/19/69
	FD	3	5	9	4	8	6	5	7/27/71	George H. Erb	18	5	7/10/69
	FE	3	5	9	4	8	6	3	7/27/71	George H. Erb	18	5	7/10/69
	FF	3	5	6	2	0	4	4	2/9/71	G.H. Erb	156	155	3/12/68
	FG	3	5	5	7	4	0	7	1/26/71	J.H. Lemelson	18	10	8/19/68
	FH	3	5	5	0	8	3	7	12/29/70	George H. Erb	229	45	4/14/69
	FI	3	5	5	0	2	2	3	12/29/70	G.H. Erb	24	204	12/22/67
	FJ	3	5	4	6	7	5	4	12/15/70	G.H. Erb	24	204	8/12/68
	FK	3	5	3	6	5	1	8	10/27/70	Arthur Herbert Drelich	117	38	3/10/67
	FL	3	5	2	2	6	3	7	8/4/70	G.C. Brumlik	24	204	3/6/68
	FM	3	4	9	4	0	0	6	2/10/70	G.C. Brumlik	24	204	1/12/68
	FN	3	4	9	0	1	0	7	1/20/70	George C. Brumlik	24	204	12/16/67
	FO	3	4	8	4	3	3	0	12/16/69	Robert C. Sokolowski et al.	161	59	4/28/66
	FP	3	4	6	9	2	8	9	9/30/69	Horace E. Whitacre	24	205.17	2/6/69
	FQ	3	4	6	1	5	1	3	8/19/69	L.H. Girard et al.	24	204	2/20/67
	FR	3	4	0	5	4	3	0	10/15/68	Abraham Sidelman	24	204	7/29/66
	FS	3	3	2	7	7	0	8	6/27/67	R.C. Sokolowski	128	156	6/27/67

FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION

		DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	FT	3533881	4/3/86	DE				
	FU	1299 897	12/13/72	FR				

OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)

	FV		
	FW		

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	GA	3	3	1	9	3	0	7	5/16/67	I. Marforio	24	204	10/12/64
	GB	3	3	1	2	5	8	3	4/4/67	James J. Rochlis	161	62	10/2/63
	GC	3	3	0	2	2	3	2	2/7/67	T.J. Wasiloff et al.	15	230.17	7/6/64
	GD	3	2	7	7	5	4	7	10/11/66	J. Billarant	24	204	12/17/62
	GE	3	2	6	6	8	4	1	8/16/66	G. Altman	297	220	7/7/65
	GF	3	2	6	6	1	1	3	8/16/66	W.C. Flanagan, Jr.	24	204	12/14/64
	GG	3	2	5	5	7	4	9	6/14/66	J.A. Smithers	128	169	6/27/63
	GH	3	2	2	6	7	5	1	1/4/66	J.H. Lemelson	15	118	2/8/63
	GI	3	2	1	4	3	2	3	10/26/65	Gordon D. Russell et al.	161	148	2/11/64
	GJ	3	1	7	6	3	6	4	4/6/65	A. Dritz	24	213	10/6/59
	GK	3	1	7	1	8	2	0	3/2/65	R.A. Volz	260	2.5	2/17/64
	GL	3	1	5	4	8	3	7	11/3/64	G. De Mestral	28	72	3/21/61
	GM	3	1	4	7	5	2	8	9/8/64	G.H. Erb	24	204	11/14/61
	GN	3	1	3	8	8	4	1	6/30/64	J. Naimer	24	204	10/23/62
	GO	3	0	9	4	3	3	0	6/18/63	G.I. Smith	273	54	3/3/61
	GP	3	0	8	5	3	0	9	4/16/63	Arthur R. Olson	28	79	3/9/60
	GQ	3	0	8	3	7	3	7	4/2/63	G. De Mestral	139	16	5/9/58
	GR	3	0	8	0	6	8	8	3/12/63	A. Politzer	51	185	6/26/62
	GS	3	0	3	1	7	3	0	5/1/62	Louis H. Morin	24	204	9/26/58
	GT	3	0	0	9	2	3	5	11/21/61	G. De Mestral	28	78	5/9/58
	GU	3	0	0	5	2	1	9	10/24/61	C.S. Miller	15	98	5/26/59
	GV	2	9	9	1	8	4	3	7/11/61	V.G. Bell, Jr.	183	51	12/30/58
	GW	2	7	1	7	4	3	7	9/13/55	G De Mestral	28	72	10/15/52
	GX	2	6	2	5	1	6	1	1/13/53	Robert W. Johnson	128	290	7/12/52
	GY	2	4	9	6	8	2	0	2/7/50	C.A. Smith	155	184	12/24/46
	GZ	2	0	3	9	3	1	2	5/5/36	J.H. Goldman	154	46	3/15/35

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INFORMATION DISCLOSURE STATEMENT CHECKLIST

Client/Matter Number: 05918/005003
 Client/Matter Name : Velcro/740 Reissue

October 28, 1997

1st Check ☒ 2nd Check ☒



The IDS is being filed:

- ☐ with a new application OR within three months of the filing date of the application.
- ☒ before the mailing date of a first office action on the merits.
- ☐ before the mailing date of a final office action OR a notice of allowance. Late fee under §1.17(p) is paid OR certification under §1.97(e)(1) is made.
- ☐ after the mailing date of a final office action OR a notice of allowance. Certification under §1.97(e)(1) is made, petition requesting consideration of the IDS is made, AND petition fee under §1.17(i)(1) is paid.

☒ The relevance of each non-English reference is described, e.g., by submitting a translation of the reference, an English abstract of the reference, or an English language counterpart application/patent of the reference.

☒ If any of the references are from a communication of a foreign patent office in a counterpart application, a copy of the communication (e.g., the search report) is enclosed.

☒ If the present application claims priority under §120, all references already cited in the parent applications are listed. No copies of these references need be provided.

☒ The PTO-1449 lists all US patent references by patent number, issue date, patentee, and class/subclass; all foreign patent references by document number, publication date, and country; and all other references by author, title, date, and place of publication.

☒ First class certificate of mailing is included, signed and dated.

☒ Postcard includes billing attorney's initials, lists all papers being sent and the number of pages of each.

☒ Preprinted envelope or label is used, which is addressed to Assistant Commissioner for Patents, Washington, DC 20231.

☒ File copies are complete, including all signatures and dates.

☒ Billing secretary's manual docket entry is updated.

☒ Action Due Record in database is updated. File copy, tab, and updated table of contents are filed in prosecution folder.

Checked By:

KRM
1st Checker

[Signature]
Handling Atty

RRT 10/30/97
2nd Checker & Date

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INSTRUCTIONS

This checklist is intended to minimize errors in the filing of PTO correspondence. It must be completed for all Information Disclosure Statements.

- Step 1** **First Checker** (typically, the handling attorney/agent's secretary) reviews each item on the checklist, completes any information requested, and checks each box in the first column of boxes. Note: The first check is done BEFORE the attorney/agent signs anything. When the first check is complete, the first checker initials the checklist where indicated and presents the response and checklist to the attorney/agent.
- Step 2** **Handling Attorney** reviews the correspondence and the first column of boxes on the checklist for completeness and initials the checklist where indicated. Once the attorney has reviewed the checklist, he or she signs the PTO correspondence and related papers and returns them to the first checker who calls the second checker.
- Step 3** **Second Checker** reviews each item on the checklist, double checks any information entered by the first checker, and checks each box in the second column of boxes. Once the double check is done, the second checker initials the checklist where indicated, seals the envelope, and gives it to office services to deliver to the Post Office.

If at any point in the above steps the PTO correspondence does not comply with the requirements of the checklist, the correspondence and checklist are to be returned to the first checker with an explanation of what is wrong so that it can be corrected.

If the PTO correspondence is filed when a second checker is unavailable, the first checker should complete the first column of boxes, ensure that all necessary signatures and copies are made, and then file the correspondence, leaving the checklist and file with the second checker to be completed the next business day.

Please forward your questions regarding this form and its use to Practice Systems.

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Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NUMBER	08/868,762	FILING DATE	06/04/97	FIRST NAMED APPLICANT	PROVOST	ATTY. DOCKET NO.	G
						EXAMINER	

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225 FRANKLIN STREET
BOSTON MA 02110-2804

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ART. CHIT	PAPER NUMBER
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3507

DATE MAILED: 01/09/98

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This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

OFFICE ACTION SUMMARY

JUN 20 2001

- ☐ Responsive to communication(s) filed on _____
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 D.C. 11; 453 O.G. 213.

TO 3600 MAIL ROOM

A shortened statutory period for response to this action is set to expire THREE month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

- ☒ Claim(s) 1-29 is/are pending in the application.
- ☒ Of the above, claim(s) 1-8 is/are withdrawn from consideration.
- ☒ Claim(s) 9-15, 17, 24 & 25 is/are allowed.
- ☒ Claim(s) 16, 18-23 & 26-29 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
- ☐ received.
- ☐ received in Application No. (Series Code/Serial Number) _____
- ☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

- ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- ☐ Notice of Reference Cited, PTO-892
- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
- ☐ Interview Summary, PTO-413
- ☒ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Notice of Informal Patent Application, PTO-152

Docketed By Billing Secretary	
Due Date:	<u>4/9/98</u>
Deadline:	<u>7/5/98</u>
Initials:	<u>TNR</u>

Docketed By Practice Systems	
Action Code:	<u>3M Action</u>
Base Date:	<u>1/9/98</u>
Due Date:	<u>4/9/98</u>
Deadline:	<u>7/9/98</u>
Initials:	<u>MTW</u>
Record:	<u>138621</u>

-SEE OFFICE ACTION ON THE FOLLOWING PAGES-



Serial Number: 08/868,762

Page 2

Art Unit: 3507

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 148 USPQ 459, that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or unobviousness.

Claims 16, 18-23 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Erb et al '067 in view of Menzin et al '000 (both cited by applicant).

Erb et al discloses applicant's claimed combination of a hook and loop fastening system by injection molding including a base, a stem connected to said base, a crook having a first end and a hook tip defining a substantially smooth curve ending at the hook tip, wherein the hook having a width, a height and a displacement volume; see Fig. 3 and the entire document except that the base with the hook stem molded integrally to the base. Menzin et al teaches the use of a planar base with hook stem molded integrally to the base; see Figs. 13-15, the abstract and the entire document. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of forming the hook and the base of Erb et al by merely



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Page 3

Art Unit: 3507

molding its base with the hook stem integrally together in the manner taught and suggested by Menzin, especially, since such modification involves only routine skill in the art.

Claims 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the same references as applied to claims 16, 18-23 and 26 above, and further in view of Provost et al '339 (cited by applicant) who teaches the use of hooks having different orientations to provide multidirectional shear operation and each of said hook is tapered and having concave fillets where the stem is connected to the base; see Figs. 11-16 and to further incorporate such structure in Erb et al in the manner taught and suggested by Provost. Furthermore, the particular shape, location and/or the arrangement selected of an element is consider to be an obvious matter of design choice, especially, since it has been held that rearranging parts of an invention involves only routine skill in the art. In re Japikse, 86 USPQ 70.

Claims 9-15, 17, 24 and 25 are allowed.

Any inquiry concerning this communication should be directed to Examiner Victor Sakran at telephone number (703) 308-2168.

Sakran/ph

January 06, 1998

**VICTOR N. SAKRAN
PRIMARY EXAMINER
ART UNIT 357**



Sheet 1 (A) of 7

SUBSTITUTE FORM PTO-1449 (MAY 1997)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762							
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (See 37 CFR 1.98(b)) Several sheets if necessary)				APPLICANT George A. Provost		FILING DATE June 4, 1997							
				GROUP 3507									
U.S. PATENT DOCUMENTS													
EXAMINER INITIAL		PATENT NUMBER						ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
[Signature]	AA	5	5	6	9	2	3	3	10/29/96	Goulait	604	391	12/20/94
	AB	5	5	4	0	6	7	3	7/30/96	Thomas et al.	604	391	1/31/95
	AC	5	4	7	0	4	1	7	11/28/95	Goulait	156	201	10/11/94
	AD	5	4	0	7	4	3	9	4/18/95	Goulait	604	391	6/1/94
	AE	5	3	9	2	4	9	8	2/28/95	Goulait et al.	24	452	12/10/92
	AF	5	3	8	5	7	0	6	1/31/95	Thomas	264	519	4/7/93
	AG	5	3	8	0	3	1	3	1/10/95	Goulait et al.	604	391	1/16/92
	AH	5	3	2	6	6	1	2	7/5/94	Goulait	428	100	5/20/91
	AI	5	3	2	6	4	1	5	7/5/94	Thomas et al.	156	244	9/3/93
	AJ	5	3	2	5	5	6	9	7/5/94	Goulait et al.	24	448	10/30/92
	AK	5	3	1	8	7	4	1	6/7/94	Thomas	264	519	6/17/93
	AL	5	2	3	1	7	3	8	8/3/93	Higashinaka	24	446	12/12/91
	AM	5	2	3	0	8	5	1	7/27/93	Thomas	264	145	3/7/91
	AN	5	2	2	1	2	7	6	6/22/93	Battrell	604	389	2/24/92
	AO	5	1	8	0	5	3	4	1/19/93	Thomas et al.	264	145	12/21/90
	FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION												
		DOCUMENT NUMBER						PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION YES NO	
[Signature]	AP	WO 94/23610						10/27/94	PCT	1	1		
	AQ	A1 0 381 087						8/8/90	EPO	1	1		
	AR	A2 0 276 970						8/3/88	EPO	1	1		
	AS	WO87/06522						11/87	PCT	1	1		
	AT	2929329						2/5/81	Fed. Rep. of Germany	1	1		X
	AU	TW 34231						12/1/80	Taiwan	1	1		X
[Signature]	AV	TW 48288						1/1/83	Taiwan	1	1		X
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)													
	AW												
EXAMINER: [Signature]										DATE CONSIDERED: Jan. 5, 1998			
EXAMINER: Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.													



Sheet 2 (B) of 7

SUBSTITUTE FORM 10-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762								
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				APPLICANT George A. Provost										
(37 C.F.R. 1.98(b))				FILING DATE June 4, 1997		GROUP 3507								
U.S. PATENT DOCUMENTS														
EXAMINER INITIAL		PATENT NUMBER							ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
BA	5	1	5	8	8	1	9	10/27/92	Goodman, Jr. et al.	428	131	6/29/90		
BB	5	1	1	9	6	4	3	6/9/92	Conley et al.	66	190	12/21/90		
BC	5	1	1	6	5	6	3	5/26/92	Thomas et al.	264	167	6/28/90		
BD	5	0	6	7	2	1	0	11/26/91	Kayaki	24	452	10/3/90		
BE	5	0	5	8	2	4	7	10/22/91	Thomas et al.	24	448	5/1/90		
BF	5	0	3	2	1	2	2	7/16/91	Noel et al.	604	391	5/17/89		
BG	4	9	9	9	0	6	7	3/12/91	Erb et al.	156	73.1	2/13/89		
BH	4	9	8	4	3	3	9	1/15/91	Provost et al.	24	452	10/20/88		
BI	4	9	7	3	3	2	6	11/27/90	Wood et al.	604	391	11/30/87		
BJ	4	9	6	3	1	4	0	10/16/90	Robertson et al.	604	389	12/17/87		
BK	4	9	5	9	2	6	5	9/25/90	Wood et al.	428	343	4/17/89		
BL	4	9	3	6	8	4	0	6/26/90	Proxmire	604	385.2	12/31/87		
BM	4	9	1	9	7	3	8	4/24/90	Ball et al.	156	73.5	5/25/89		
BN	4	8	9	4	0	6	0	1/16/90	Nestegard	604	391	1/11/88		
BO	4	8	8	3	7	0	7	11/28/89	Newkirk	428	219	4/21/88		
BP	4	8	6	1	3	9	9	8/29/89	Rajala et al.	156	66	11/4/87		
BQ	4	8	5	4	9	8	4	8/8/89	Ball et al.	156	73.5	6/19/87		
BR	4	8	4	6	8	1	5	7/11/89	Scripps	604	391	12/18/87		
BS	4	8	3	4	7	3	8	5/30/89	Kielpikowski et al.	604	385.2	7/14/88		
BT	4	7	9	4	0	2	8	12/27/88	Fischer	428	100	5/15/86		
BU	4	7	6	1	3	2	2	8/2/88	Raley	428	156	10/7/85		
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		DOCUMENT NUMBER						PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION		
												YES	NO	
BV	55-137942							10/28/80	Japan				X (abs only)	
BW	54-28369							3/2/79	Japan				X (abs only)	
BX	51-14535							5/10/76	Japan				X (abs only)	
BY	JP 02-88015							3/28/90	Japan					X
BZ	GB 2 233 876 A							1/23/91	GB					
EXAMINER <i>Chakrabarti</i>									DATE CONSIDERED <i>Jan 5, 1998</i>					
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SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762							
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) (37 CFR 1.121)				APPLICANT George A. Provost		GROUP 3507							
				FILING DATE June 4, 1997									
U.S. PATENT DOCUMENTS													
EXAMINER INITIAL		PATENT NUMBER						ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
100	CA	4	7	6	1	3	1	8	8/2/88	Ott et al.	428	89	8/29/86
	CB	4	7	3	9	6	3	5	4/26/88	Conley et al.	66	190	7/8/87
	CC	4	7	3	7	4	0	4	4/12/88	Jackson	428	284	8/16/84
	CD	4	7	2	5	4	7	3	2/16/88	Van Gompel et al.	428	156	11/25/86
	CE	4	7	2	5	2	2	1	2/16/88	Blanz	425	575	5/23/86
	CF	4	7	0	7	8	9	3	11/24/87	Hashizume et al.	24	446	5/2/86
	CG	4	6	9	9	6	2	2	10/13/87	Toussant et al.	604	389	3/21/86
	CH	4	6	9	5	5	0	0	9/22/87	Dyer et al.	428	134	7/10/86
	CI	4	6	7	2	8	9	3	6/16/87	Mammarella, Sr.	101	170	3/21/85
	CJ	4	6	5	4	2	4	6	3/31/87	Provost et al.	428	88	9/5/85
	CK	4	6	1	5	0	8	4	10/7/86	Erb	24	442	8/21/84
	CL	4	6	0	0	6	1	8	7/15/86	Raychok, Jr. et al.	428	92	3/16/84
	CM	4	5	9	6	5	6	8	6/24/86	Flug	604	369	10/22/84
	CN	4	5	8	7	1	5	2	5/6/86	Gleichenhagen et al.	428	195	12/11/84
	CO	4	5	7	3	9	9	1	3/4/86	Pieniak et al.	604	385	7/23/84
	CP	4	5	6	2	0	9	9	12/31/85	Hinchcliffe	427	282	1/18/84
	CQ	4	5	3	2	1	5	7	7/30/85	Schmidt et al.	427	262	12/27/82
	CR	4	4	6	3	4	8	6	8/7/84	Matsuda	28	161	8/12/81
	CS	4	4	5	4	1	8	3	6/12/84	Wollman	428	100	10/20/83
FOREIGN PARENT OR PUBLISHED FOREIGN PATENT APPLICATION													
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							YES	NO					
100	CT	GB 1 140 576	1/22/69	GB	—	—							
	CU	FR 2 586 558	3/6/87	FR	—	—	X (abs only)						
	CV	FR 2 586 558	3/6/87	FR	—	—	X						
100	CW	DE 3533541-A	4/3/86	DE	—	—		X					
	CX	0 187 725 B1	3/27/91	EPO	—	—							
EXAMINER: <i>Victor Saban</i>					DATE CONSIDERED: <i>Jan. 5, 1998</i>								
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SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762		
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				APPLICANT George A. Provost		GROUP 3507		
(37 CFR)				FILING DATE June 4, 1997				
U.S. PATENT DOCUMENTS								
EXAMINER INITIAL		PATENT NUMBER		ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
DA	4 4 0 2 6 9 0	9/6/83	Redfern	604	391	10/21/80		
DB	4 3 7 9 1 9 2	4/5/83	Wahlquist et al.	428	156	6/23/82		
DC	4 3 7 4 8 8 8	2/22/83	Bornslaeger	429	198	9/25/81		
DD	4 3 5 5 0 6 6	10/19/82	Newman	428	198	12/8/80		
DE	4 3 3 0 9 0 7	5/25/82	Ochiai	24	204	3/31/80		
DF	4 3 0 7 4 9 3	12/29/81	Ochiai	24	204	3/31/80		
DG	4 2 9 0 8 3 2	9/22/81	Kalleberg	156	72	9/2/77		
DH	4 2 9 0 1 9 4	9/22/81	Takahashi	29	766	11/1/79		
DI	4 2 9 0 1 7 4	9/22/81	Kalleberg	24	204	1/13/78		
DJ	4 2 1 6 2 5 7	8/5/80	Schams et al.	428	93	4/20/79		
DK	4 1 6 9 3 0 3	10/2/79	Lemelson	24	204	11/24/76		
DL	4 1 6 2 3 4 4	7/24/79	Rones	428	212	7/27/78		
DM	4 0 8 2 8 8 6	4/4/78	Butterworth et al.	428	284	9/15/77		
DN	4 0 6 7 6 0 9	1/10/78	Ness	297	220	11/22/76		
DO	4 0 5 6 5 9 3	1/1/77	de Navas Albareda	264	145	6/21/74		
DP	4 0 2 4 0 0 3	5/17/77	Bühler	156	148	5/27/75		
DQ	3 9 7 1 3 8 1	7/27/76	Gibson	128	296	2/19/75		
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION								
	DOCUMENT NUMBER	PUBLICATION DATE	COUNTRY OR PATENT OFFICE	CLASS	SUBCLASS	TRANSLATION YES NO		
DR	0 324 577 A1	7/19/89	EPO					
DS	0 289 198 A1	11/2/88	EPO					
DT	0 325 473 A1	7/26/89	EPO					
DU	0 341 993 A1	11/15/89	EPO					
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)								
DV								
DW								
EXAMINER <i>Victor Salomon</i>				DATE CONSIDERED <i>Jan. 5, 1998</i>				
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Sheet 5 (E) of 7

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762								
NOV 03 1997 INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				APPLICANT George A. Provost		FILING DATE June 4, 1997								
				GROUP		3507								
U.S. PATENT DOCUMENTS														
EXAMINER INITIAL		PATENT NUMBER						ISSUE DATE	PATENTEE		CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
EA	3	9	4	9	1	2	8	4/6/76	Ostermeier	428	152	8/22/72		
EB	3	9	4	3	9	8	1	3/16/76	De Brabander	139	391	3/25/74		
EC	3	9	1	3	1	8	3	10/21/75	Brumlik	24	204	6/28/73		
ED	3	9	0	5	0	7	1	9/16/75	Brumlik	24	204	8/13/73		
EE	3	8	9	5	7	9	7	7/22/75	Moore	273	32 A	7/17/74		
EF	3	8	6	7	9	4	0	2/25/75	Mesek et al.	128	287	8/6/73		
EG	3	8	6	7	9	3	5	2/25/75	Elsdorfer et al.	128	156	5/14/73		
EH	3	8	6	3	3	0	4	2/4/75	Brumlik	24	204	8/8/73		
EI	3	7	7	0	3	5	9	11/6/73	Hamano	425	305	9/25/72		
EJ	3	7	6	8	4	7	9	10/30/73	Widlund	128	287	2/8/71		
EK	3	7	6	2	0	0	0	10/2/73	Menzin et al.	24	204	11/11/71		
EL	3	7	0	8	8	3	7	1/9/73	Chiba	24	204	5/13/70		
EM	3	7	0	8	8	3	3	1/9/73	Ribich et al.	24	204	3/15/71		
EN	3	7	0	8	8	3	2	1/2/73	G.H. Erb	161	48	7/15/69		
EO	3	6	9	4	8	6	7	10/3/72	Stumpf	24	204	8/5/70		
EP	3	6	8	3	9	2	1	8/15/72	Brooks et al.	128	296	8/17/70		
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EQ		0 388 681 A2						9/26/90	EPO		1	1		
ER		0 353 972 A1						2/7/90	EPO		1	1		
ES		0 409 315 A1						1/23/91	EPO		1	1		
ET		2 432 108						3/28/80	FR		1	1	X (abs only)	
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)														
	EU													
	EV													
EXAMINER Victor Salinas								DATE CONSIDERED Jan. 5, 1998						
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Sheet 6 (F) of 7

SUBSTITUTE FORM PTO-1449 (MODIFIED)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762								
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary) (37)				APPLICANT George A. Provost		FILING DATE June 4, 1997								
				GROUP 3507										
U.S. PATENT DOCUMENTS														
EXAMINER INITIAL		PATENT NUMBER						ISSUE DATE	PATENTEE		CLASS	SUBCLASS	FILING DATE IF APPROPRIATE	
<i>[Signature]</i>	FA	3	6	7	8	9	3	3	7/25/72	Moore et al.	128	296	7/17/70	
	FB	3	6	6	5	9	2	2	5/30/72	Skora	128	290	11/20/69	
	FC	3	6	6	5	9	2	1	5/30/72	Stumpf	128	287	11/19/69	
	FD	3	5	9	4	8	6	5	7/27/71	George H. Erb	18	5	7/10/69	
	FE	3	5	9	4	8	6	3	7/27/71	George H. Erb	18	5	7/10/69	
	FF	3	5	6	2	0	4	4	2/9/71	G.H. Erb	156	155	3/12/68	
	FG	3	5	5	7	4	0	7	1/26/71	J.H. Lemelson	18	10	8/19/68	
	FH	3	5	5	0	8	3	7	12/29/70	George H. Erb	229	45	4/14/69	
	FI	3	5	5	0	2	2	3	12/29/70	G.H. Erb	24	204	12/22/67	
	FJ	3	5	4	6	7	5	4	12/15/70	G.H. Erb	24	204	8/12/68	
	FK	3	5	3	6	5	1	8	10/27/70	Arthur Herbert Drelich	117	38	3/10/67	
	FL	3	5	2	2	6	3	7	8/4/70	G.C. Brumlik	24	204	3/6/68	
	FM	3	4	9	4	0	0	6	2/10/70	G.C. Brumlik	24	204	1/12/68	
	FN	3	4	9	0	1	0	7	1/20/70	George C. Brumlik	24	204	12/16/67	
	FO	3	4	8	4	3	3	0	12/16/69	Robert C. Sokolowski et al.	161	59	4/28/66	
	FP	3	4	6	9	2	8	9	9/30/69	Horace E. Whitacre	24	205.17	2/6/69	
	FQ	3	4	6	1	5	1	3	8/19/69	L.H. Girard et al.	24	204	2/20/67	
	FR	3	4	0	5	4	3	0	10/15/68	Abraham Sidelman	24	204	7/29/66	
FS	3	3	2	7	7	0	8	6/27/67	R.C. Sokolowski	128	156	6/27/67		
FOREIGN PATENT OR PUBLISHED FOREIGN PATENT APPLICATION														
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<i>[Signature]</i>	FT	3533881						4/3/86	DE		—	—	X (abs only)	
	FU	1299 897						12/13/72	GB		—	—		
OTHER DOCUMENTS (Including Author, Title, Date, Place of Publication)														
	FV													
	FW													
EXAMINER <i>[Signature]</i> DATE CONSIDERED <i>Jan. 5, 1998</i>														
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Sheet 7 (G) of 7

SUBSTITUTE FORM PTO-1449 (MAY 1997 EDITION)		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. 05918/005003		SERIAL NO. 08/868,762						
INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use several sheets if necessary)				APPLICANT George A. Provost		FILING DATE June 4, 1997						
				GROUP		3507						
U.S. PATENT DOCUMENTS												
EXAMINER INITIAL		PATENT NUMBER						ISSUE DATE	PATENTEE	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
GA	3	3	1	9	3	0	7	5/16/67	I. Marforio	24	204	10/12/64
GB	3	3	1	2	5	8	3	4/4/67	James J. Rochlis	161	62	10/2/63
GC	3	3	0	2	2	3	2	2/7/67	T.J. Wasiloff et al.	15	230.17	7/6/64
GD	3	2	7	7	5	4	7	10/11/66	J. Billarant	24	204	12/17/62
GE	3	2	6	6	8	4	1	8/16/66	G. Altman	297	220	7/7/65
GF	3	2	6	6	1	1	3	8/16/66	W.C. Flanagan, Jr.	24	204	12/14/64
GG	3	2	5	5	7	4	9	6/14/66	J.A. Smithers	128	169	6/27/63
GH	3	2	2	6	7	5	1	1/4/66	J.H. Lemelson	15	118	2/8/63
GI	3	2	1	4	3	2	3	10/26/65	Gordon D. Russell et al.	161	148	2/11/64
GJ	3	1	7	6	3	6	4	4/6/65	A. Dritz	24	213	10/6/59
GK	3	1	7	1	8	2	0	3/2/65	R.A. Volz	260	2.5	2/17/64
GL	3	1	5	4	8	3	7	11/3/64	G. De Mestral	28	72	3/21/61
GM	3	1	4	7	5	2	8	9/8/64	G.H. Erb	24	204	11/14/61
GN	3	1	3	8	8	4	1	6/30/64	J. Naimer	24	204	10/23/62
GO	3	0	9	4	3	3	0	6/18/63	G.I. Smith	273	54	3/3/61
GP	3	0	8	5	3	0	9	4/16/63	Arthur R. Olson	28	79	3/9/60
GQ	3	0	8	3	7	3	7	4/2/63	G. De Mestral	139	16	5/9/58
GR	3	0	8	0	6	8	8	3/12/63	A. Politzer	51	185	6/26/62
GS	3	0	3	1	7	3	0	5/1/62	Louis H. Morin	24	204	9/26/58
GT	3	0	0	9	2	3	5	11/21/61	G. De Mestral	28	78	5/9/58
GU	3	0	0	5	2	1	9	10/24/61	C.S. Miller	15	98	5/26/59
GV	2	9	9	1	8	4	3	7/11/61	V.G. Bell, Jr.	183	51	12/30/58
GW	2	7	1	7	4	3	7	9/13/55	G De Mestral	28	72	10/15/52
GX	2	6	2	5	1	6	1	1/13/53	Robert W. Johnson	128	290	7/12/52
GY	2	4	9	6	8	2	0	2/7/50	C.A. Smith	155	184	12/24/46
GZ	2	0	3	9	3	1	2	5/5/36	J.H. Goldman	154	46	3/15/35

EXAMINER INITIAL <i>GA</i>	DATE CONSIDERED <i>Jan 5, 1998</i>
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EXAMINER Initial citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

868762



NOTICE OF DRAFTPERSON'S PATENT DRAWING REVIEW

The drawing filed (insert date) 6/4/97 are:

A. 6/4/97 not objected to by the Draftperson under 37 CFR 1.84 or 1.152.

B. 6/4/97 objected to by the Draftperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings where necessary. Corrected drawings must be submitted according to the instructions on the back of this notice.

<p>1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings: Black ink. Color. _____ Color drawing are not acceptable until petition is granted. Fig(s) _____ Pencil and non black ink is not permitted. Fig(s) _____</p> <p>2. PHOTOGRAPHS. 37 CFR 1.84(b) _____ Photographs are not acceptable until petition is granted, _____ 3 full-tone sets are required. Fig(s) _____ _____ Photographs not properly mounted (must bristol board or photographic double-weight paper). Fig(s) _____ _____ Poor quality (half-tone). Fig(s) _____</p> <p>3. TYPE OF PAPER. 37 CFR 1.84(e) _____ Paper not flexible, strong, white and durable. Fig(s) _____ _____ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not acceptable. (too thin) _____ Mylar, vellum paper is not acceptable (too thin). Fig(s) _____</p> <p>4. SIZE OF PAPER. 37 CFR 1.84(f): Acceptable sizes: _____ 21.0 cm by 29.7 cm (DIN size A4) _____ 21.6 cm by 29.7 cm (8 1/2 x 11 inches) _____ All drawings sheets not the same size. Sheet(s) _____</p> <p>5. MARGINS. 37 CFR 1.84(g): Acceptable margins: Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: A4 Size Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm SIZE: 8 1/2 x 11 _____ Margins not acceptable. Fig(s) _____ _____ Top (T) _____ Left (L) _____ Right (R) _____ Bottom (B)</p> <p>6. VIEWS. CFR 1.84(h) REMINDER: Specification may require revision to correspond to drawing changes. _____ Views connected by projection lines or lead lines. Fig(s) _____ Partial views. 37 CFR 1.84(h)(2) _____ Brackets needed to show figure as one entity. Fig(s) _____ _____ Views not labeled separately or properly. Fig(s) _____ _____ Enlarged view not labeled separately or properly. Fig(s) _____</p>	<p>7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3) _____ Hatching not indicated for sectional portions of an object. Fig(s) _____ _____ Sectional designation should be noted with Arabic or Roman numbers. Fig(s) _____</p> <p>8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i) _____ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned, so that the top becomes the right side, except for graphs. Fig(s) _____ _____ Views not on the same plane on drawing sheet. Fig(s) _____</p> <p>9. SCALE. 37 CFR 1.84(k) _____ Scale not large enough to show mechanism with crowding when drawing is reduced in size to two-thirds in reproduction. Fig(s) _____</p> <p>10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l) _____ Lines, numbers & letters not uniformly thick and well defined, clean, durable and black (poor line quality). Fig(s) <u>1-12</u></p> <p>11. SHADING. 37 CFR 1.84(m) _____ Solid black areas pale. Fig(s) _____ _____ Solid black shading not permitted. Fig(s) _____ _____ Shade lines, pale, rough and blurred. Fig(s) _____</p> <p>12. NUMBERS, LETTERS, & REFERENCE CHARACTERS. 37 CFR 1.48(p) _____ Numbers and reference characters not plain and legible. Fig(s) <u>1-5, 6</u> _____ Figure legends are poor. Fig(s) _____ _____ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(3) Fig(s) _____ _____ English alphabet not used. 37 CFR 1.84(p)(3) Fig(s) _____ _____ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig(s) <u>1-5, 6</u></p> <p>13. LEAD LINES. 37 CFR 1.84(q) _____ Lead lines cross each other. Fig(s) _____ _____ Lead lines missing. Fig(s) _____</p> <p>14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.48(i) _____ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Fig(s) _____</p> <p>15. NUMBERING OF VIEWS. 37 CFR 1.84(u) _____ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig(s) _____</p> <p>16. CORRECTIONS. 37 CFR 1.84(w) _____ Corrections not made from PTO-948 dated _____</p> <p>17. DESIGN DRAWINGS. 37 CFR 1.152 _____ Surface shading shown not appropriate. Fig(s) _____ _____ Solid black shading not used for color contrast. Fig(s) _____</p>
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COMMENTS

REVIEWER

DATE

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ATTACHMENT TO PAPER NO. 5

APPLICANT'S COPY



#13A
1/31/03
BW

PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Serial No.: 08/868,762
Filed : June 4, 1997
Title : HOOK FOR HOOK AND LOOP FASTENERS

Art Unit: 3507
Examiner: Sakran, V.

RECEIVED

Assistant Commissioner for Patents
Washington, DC 20231

JUN 20 2001

RESPONSE

TO 3600 MAIL ROOM

This Response is to the office action mailed January 9, 1998. In the office action, the Examiner allowed claims 9-15, 17, 24 and 25. The Examiner rejected claims 16 and 18-23 as being unpatentable under 35 U.S.C. §103 over Erb et al., U.S. 4,999,067, in view of Menzin et al., U.S. 3,762,000, and rejected claims 26-29 as being unpatentable under section 35 U.S.C. §103 for the same reasons as claims 16 and 18-23 further in view of Provost et al., U.S. 4,984,339.

Applicant submits that the references cited by the Examiner not only do not disclose or suggest the claimed invention, but, in fact, teach away from combining individual features of each in the manner suggested by the Examiner; none of the cited references even recognizes the problem addressed and solved by Applicant's invention.

Before discussing the art cited by the Examiner, it is helpful to review the features of the invention recited in independent claims 16, 18 and 19, that, when considered as a whole, are not suggested by the cited art. Each of claims 16, 18

Date of Deposit April 27, 1998
I hereby certify under 37 CFR 1.8(a) that this correspondence is being deposited with the United States Postal Service as first class mail with sufficient postage on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Tom J. Sakran

and 19 is directed to a molded plastic hook product having a multiplicity of hooks in adjacent rows, molded integrally with a common base, the hooks sized and shaped to be capable of engaging low level loops, i.e. loops of a loop product having a pile height of approximately 0.04 inches or less. As mentioned in the specification, "this is a fraction of standard loops such as loop 1000 sold by Velcro USA Inc. which has a loop height of approximately 0.100 inches" (col. 5, third full paragraph).

The ability to engage low pile loops, such as presented by thin non woven materials, is very desirable because of the flexibility and very low cost of such materials.

Applicant discovered that, in the defined hook product, if the hooks in the adjacent rows on the common base each has a displacement volume less than 6×10^{-6} cubic inches, the product has a significantly improved capability of engaging with a mating component having low pile loops.

Erb was directed to a very different problem, the design of a hermaphrodite (bifunctional) fastening product. Erb does not have rows of hooks that are adjacent to each other, i.e. hook rows that immediately follow, each other. Instead, each row of Erb's hooks is adjacent fields of loops, on both sides.

Erb taught (a) a loop-bearing textile substrate such as velvet, in which loops¹ of the textile fabric were as

¹Erb's loops were not low lying. Figures 9 and 10 show that Erb's loops 164 are about 50% taller than his hooks 85. By Erb's FIGS. 3 and 4 and Example 1 at column 7 of Erb, the height of the hooks is $V - (Y + D)$, or $0.109 - (0.042 + 0.015)$ inches = 0.054 inches. Thus, Erb's loops were approximately 0.08 inches in height, about twice as high as the maximum loop pile height

predominant as hooks, and (b) discretely formed hook strips, each carrying a row of small hooks, the strips being individually staked at spaced intervals into the textile fabric.

As Erb stated:

"[A] very large proportion of the loops on the upperside of the substrate advantageously remain undisturbed and available **between** the resulting rows of hooks" for "mating with an opposed hook-bearing fastener" (col. 1, lines 34-39; col. 2, lines 8-12). The "hermaphrodite fastener 190 includes rows of multiplicities of upstanding hooks 85 and multiplicities of loops 164, spread over the area of the substrate 150, between the rows 192 of hooks, as seen in FIGS. 9 and 10" (col. 11, lines 18-25). The "hermaphrodite hook and loop fastener can mate with (i) an opposed hermaphrodite hook and loop fastener or with (ii) an opposed loop fastener medium or with (iii) an opposed hook fastener medium," (col. 2, lines 59-63).

Erb's upstanding loops on both sides of each row of hooks were an essential component of his bifunctional product. The specific size and configuration of hooks that Erb used were obviously directed to the special context of a product having adjacent loops and hooks. By this arrangement Erb's fastener component would mate with a mating component having loops of the same kind as the loops on Erb's bifunctional fastener component.

Erb has no suggestion that a fastener component, reconstructed to mold only hooks of his configuration in adjacent

recited in claims 16, 18 and 19. Erb, lacking low lying loops, has no teaching of applicant's principle.

rows, integral with a common base, would have any useful purpose in any context; certainly Erb contains no fair teaching that such a hook component would solve the design need for efficiently engaging a mating low-lying loop component.

Specifically, Erb has no fair teaching that his hermaphrodite product should somehow be modified by eliminating the fabric base, the loops and the bifunctional character, and instead provide hooks in "adjacent rows," molded integrally with a plastic base. This "reconstruction" would destroy the sole purpose of Erb's construction!

Also, there was no motivation to attempt, in some unspecified way, to manufacture Erb's hermaphroditic loop/hook product by the Menzin technique.²

The Board in *Ex parte Sternau*, 155 U.S.P.Q. 733, 735 (Bd. App. 1967), said:

However, there is nothing in the disclosures of [primary reference] Young and [secondary reference] Haslach that would teach the Examiner's proposed combination or any reason for making it. In fact, the proposed combination would destroy the Young apparatus for its intended purpose. Thus, we will reverse the rejection of claims 44 and 45 for this reason.

As in Sternau, neither Erb nor Menzin teaches the Examiner's proposed combination³ or any reason for making it.

²Or the Fischer technique, see 4,794,028, also cited by Applicant.

³The Examiner, in the reasons for rejection, made no mention, and appears to have inadvertently overlooked, a key limitation of the pending claims, that there be "a multiplicity of plastic hooks in adjacent rows". Each row of Erb's hooks were adjacent loops, not hooks.

To summarize, neither Erb nor Menzin recognizes the problem solved by Applicant's invention; attempted combination of Menzin with Erb would destroy Erb's function; neither of the references alone or by any fair understanding of their teachings, taken together, suggests a solution to the problem solved by Applicant.

We submit that the Examiner has not shown a prima facie case of obviousness, and we request the rejection of claims 16, 18 and 19 be withdrawn. Dependent claims 20-23 and 26-29 include all of the limitations of claims 16, 18 and 19 discussed above, and are patentable for the same reasons.

Applicant submits that all of the claims are now in condition for allowance, which action is requested.

Applicant herein requests a one month extension of time in which to file this Response. Filed herewith is a Petition for Automatic Extension with the required fee.

Please charge any additional fees, or make any credits, to Deposit Account No. 06-1050.

Respectfully submitted,

Date:

April 29, 1998



John N. Williams
Reg. No. 18,948

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Boston, MA 02110-2804

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PATENT
ATTORNEY DOCKET NO. 05918/005003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : George A. Provost
Serial No.: 08/868,762
Filed : June 4, 1997
Title : HOOK FOR HOOK AND LOOP FASTENERS

Art Unit: 3507
Examiner: Sakran, V.

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Assistant Commissioner for Patents
Washington, DC 20231

JUN 20 2001

PETITION FOR EXTENSION OF TIME

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Pursuant to 37 C.F.R. §1.136, applicants hereby
petition that the period for response to examiner's action mailed
January 9, 1998, be extended for one month to and including
May 9, 1998.

Enclosed is a check for \$110 for the required fee.

Please apply any other charges or any credits to our
deposit account number 06-1050.

Respectfully submitted,

Date:

April 29, 1998

John N. Williams
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Date of Deposit

April 29, 1998

I hereby certify under 37 CFR 1.8(a) that this correspondence is being
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Tom Sakran

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JUN 20 2001

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225 FRANKLIN STREET
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BY [Signature]

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PATENT

ATTORNEY DOCKET NO.: 05918/005003

The Patent and Trademark Office date stamp sets forth the date of receipt of:

Applicant or Patentee George A. Provost

No. (Application, Appeal, Interference, Patent, Reexam) 08/868,762

Filing or Issue Date June 4, 1997

Title HOOK FOR HOOK AND LOOP FASTENERS

- ☐ Transmittal Letter (2 copies) ☐ With Pet. for Ext.
- ☐ Assignment ☐ Status Inquiry
- ☒ Amendment/Response 5 Pages ☐ Declaration
- ☐ Maintenance Fee ☐ Request Certificate of Correction
- ☒ Check \$ 110 ☐ Notice of Appeal
- ☐ Deposit Account Order Form (2 copies) ☐ Appeal Brief (3 copies) Pages
- ☐ Issue Fee ☐ Request Patent Copies ☒ Petition for Extension of Time
- ☐ Information Disclosure Statement
- ☐ PTO 1449 Form - Pages
- ☐ Prior Art References - Number of References
- ☐ Drawings Sheets Formal Sheets Informal Sheets Amended
- ☐ Notice of Missing Parts
- ☐ Combined Declaration and Power of Attorney
- ☐ Small Entity Statement
- ☐ Other

Atty/Sec. JNW/ Client/ Velcro/'740 Reissue
Initials TMS Matter Name

Date 4/29/98

RESPONSE TO EXAMINER'S ACTION CHECKLIST

Client/Matter Number: 05918/005003
 Client/Matter Name : Velcro/'740 Reissue

April 29, 1998

LEGAL STAFF



Examiner's comments checked to confirm that all objections and rejections have been addressed.

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JUN 20 2001

Handling Atty

TO 3600 MAIL ROOM

SECRETARY/PS

1st Check 2nd Check

- ☒ ☒ Mailing date of the Action checked to confirm the due date was docketed correctly and is satisfied by the response.
- ☒ ☒ If required, a Petition for Extension of Time and a check for the small/large entity fee under 37 CFR §1.136(a) is included. Check amount: no
- ☒ ☒ Response identifies the mailing date of Action, lists all items being submitted, and includes the standard charges/credits statement.
- ☒ ☒ All previously filed IDSs have been considered by the examiner and PTO Forms 1449 have been returned with each item of art initialled. If not, consideration and return is requested in the response.
- ☒ ☒ If required by amendments to the claims, a check for the small/large entity fee for any net additional claims is included. Check amount: _____
- ☒ ☒ If responding to a FINAL action less than one month from the SIX-MONTH FINAL DEADLINE and a Notice of Allowance is not virtually certain to result from the amendments made, a Notice of Appeal or continuation application is included.
- ☒ ☒ First class certificate of mailing is included, signed and dated.
- ☒ ☒ Postcard includes billing attorney's initials and lists all papers being sent and the number of pages of each.
- ☒ ☒ Preprinted envelope or label is used, which is addressed to Assistant Commissioner for Patents, Washington, DC 20231.
- ☒ ☒ File copies are complete, including all signatures and dates.
- ☒ ☒ Billing secretary's manual docket entry is updated.
- ☒ ☒ Action Due Record in database is updated. File copy, tab, and updated table of contents are filed in prosecution folder.

Checked By: TMS
 1st Checker

Handling Atty

HNT K/29
 2nd Checker & Date

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INSTRUCTIONS

This checklist is intended to minimize errors in the filing of responses to Examiner's Actions. It must be completed for all responses to examiner's actions.

Where applicable, macros must be used in preparing the response.

- Step 1** **Handling Attorney** reviews each item on the "substantive" part of the checklist, completes any information requested, checks each box in the first column of boxes, and initials where indicated.
- Step 2** **First Checker** (typically, the handling attorney/agent's secretary) reviews each item on the "non-substantive" part of the checklist, completes any information requested, and checks each box in the first column of boxes. Note: The first check is done BEFORE the attorney/agent signs anything. When the first check is complete, the first checker initials the checklist where indicated and presents the response and checklist to the attorney/agent.
- Step 3** **Handling Attorney** reviews the response and the first column of boxes on the checklist for completeness and initials the checklist where indicated. Once the attorney has reviewed the checklist, he or she signs the response and related papers and returns the response to the first checker who calls the second checker.
- Step 4** **Second Checker** reviews each item on the checklist, double checks any information entered by the first checker, and checks each box in the second column of boxes. Once the double check is done, the second checker initials the checklist where indicated, seals the envelope, and gives it to office services to deliver to the Post Office.

If at any point in the above steps the response does not comply with the requirements of the checklist, the response and checklist are to be returned to the first checker with an explanation of what is wrong so that it can be corrected.

If the response is filed when a second checker is unavailable, the first checker should complete the first column of boxes, ensure that all necessary signatures and copies are made, and then file the response, leaving the checklist and file with the second checker to be completed the next business day.

Please forward your questions regarding this form and its use to Practice Systems.

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Date September 15, 1999

To Examiner Tony Knight
US PTO

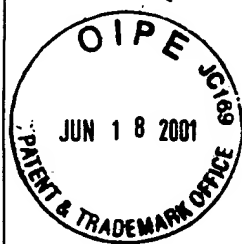
Facsimile number 05918 00500003 703-305-7687

From James W. Babineau

Re U.S. Serial No. 08/868,762, Filed 06/04/97

**Number of pages
including this page** 7

NOTE: This facsimile is intended for the addressee only and may contain privileged or confidential information. If you have received this facsimile in error, please call us collect at 617 542-5070 immediately to arrange for its return. Thank you.



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